Video colour camera VK4101

Service
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Service Manual

INTRODUCTION

The VK4101 is a relatively simple colour camera equipped with a fixed 3x zoom lens, and a ½" New vicon pickup tube. It produces an acceptable picture with as little as 20 lux.
A 1" electronic B/W viewfinder is incorporated in the body. A 2x magnifying lens, which can be flipped-up, sets the viewing-angle to infinite.
In the viewer the three leds for indication under exposure, trigger/batt. warning and VCR are available.
The camera is equipped with an automatic diaphragm control unit.
An orange filter is used to adapt the camera to outside conditions.
The co-supplied microphone can be removed and an external microphone can then be connected to the mic.-socket.
A ¼" whitworth nut in the bottom allows tripod-use of the camera.

TECHNICAL DATA

Pick up tube		: ½" Newvicon S4161P
System		: Cross filter 3.9 MHz
Video output		: 1 V_{pp} across 75 Ω
Sensitivity		: Good picture at 20 lux full output (1 V_{pp}) at 100 lux
S/N ratio		: > 45 dB
Resolution		: 270 lines
Audio output		: —20 dB across 1 kΩ
Frequency response		: 100-5000 Hz
Harm. distorsion		: < 5%
S/N ratio		: > 40 dB
Power supply		: 10.8 - 14.4 V
Power consumption		: 4.6 W at 12 V
View finder		: 1" B/W picture tube with tip up lens
Indication leds:	red	: Under exposure
	yellow	: Trigger empty battery when flashing
	green	: VCR status
Tripod mounting		: ¼" whitworth
Lens		: 3x zoom; F1.4
Dimensions		: 225x113x60 (body)
Weight		: 1.2 kg

DocumentationTechnique Service Dokumentation Documentazione di Servizio Huolte-Ohje Manual de Servicio Manual de Serviçio

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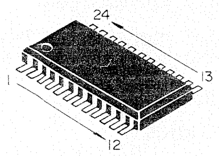
Service Consumer Electronics

SURVEY OF SYMBOLS AND ABBREVIATIONS

Abbreviations

SSG	Sync signal generator
CS	Composite sync signal
VD	Vertical drive pulse
BF	Burst flag pulse
HD	Horizontal drive pulse
WHD	Widened horizontal drive pulse
CP2	Clamp pulse 2
CP1	Clamp pulse 1
CBL	Composite blanking pulse
WBL	Widened blanking pulse
(C)VBS	(Colour) Video blanking sync
EVF	Electronic view finder
TR	Tracking
PED	Pedestal
BLK	Blanking
SC	Subcarrier
CCD	Charged coupled device

CONNECTIONS OF SEMICONDUCTORS



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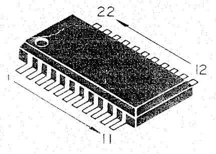
AN2310S
AN2320S
AN2510S
AN2210S



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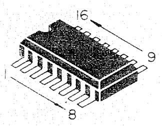

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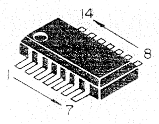

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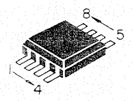

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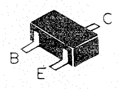
MN8037S



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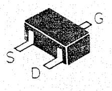
2SA1122CC
2SA1226E3
2SA812-M5
2SA812-M6

2SB792R
2SC1623L/
2SC1623L5
2SC1623L6
2SC2404-C
2SC2462-C
2SC2618RC

2SD814R



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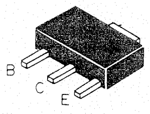

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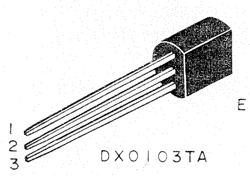

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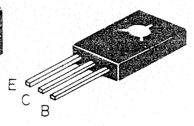

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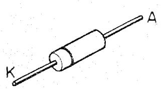

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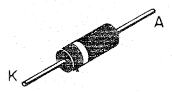

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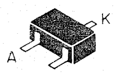
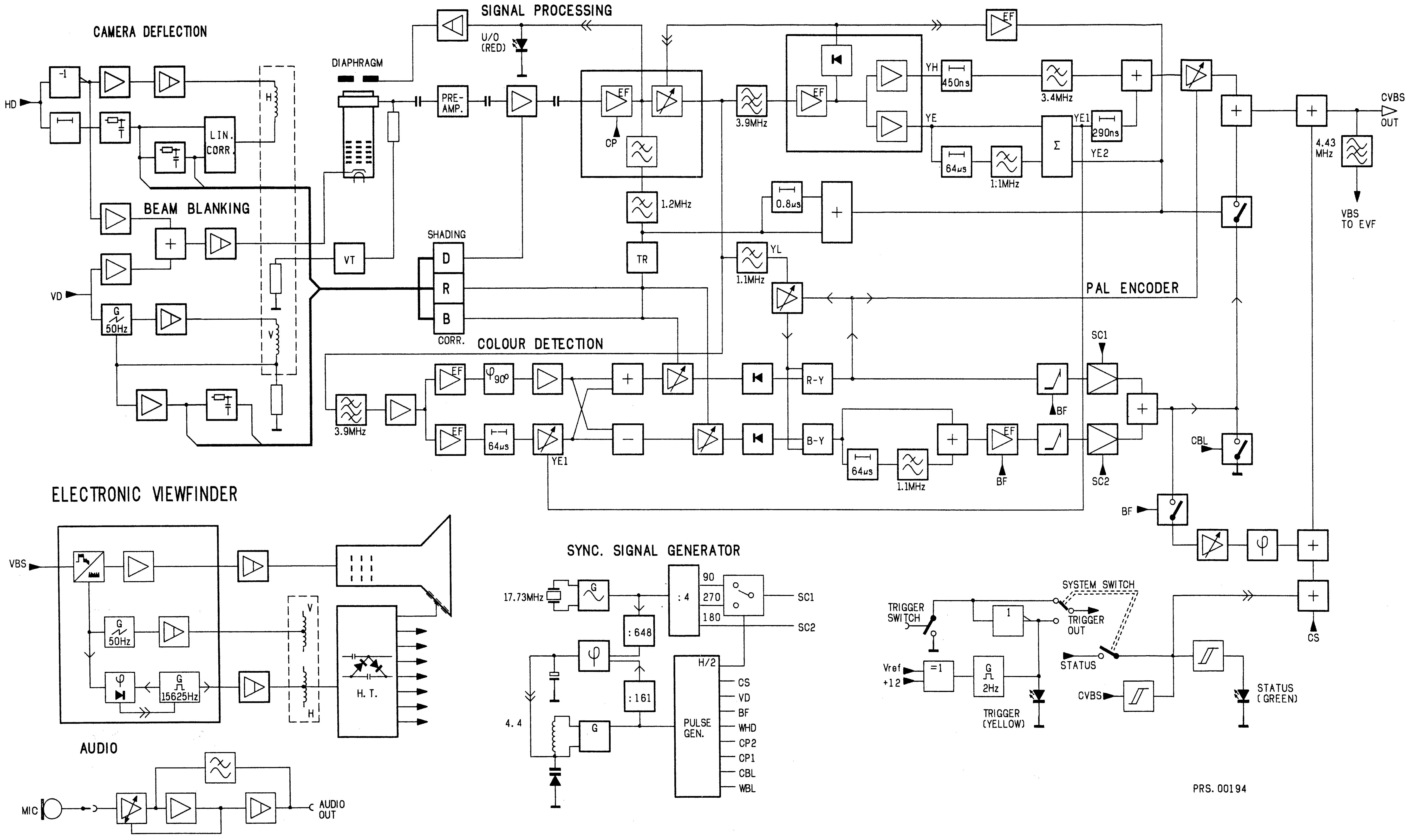


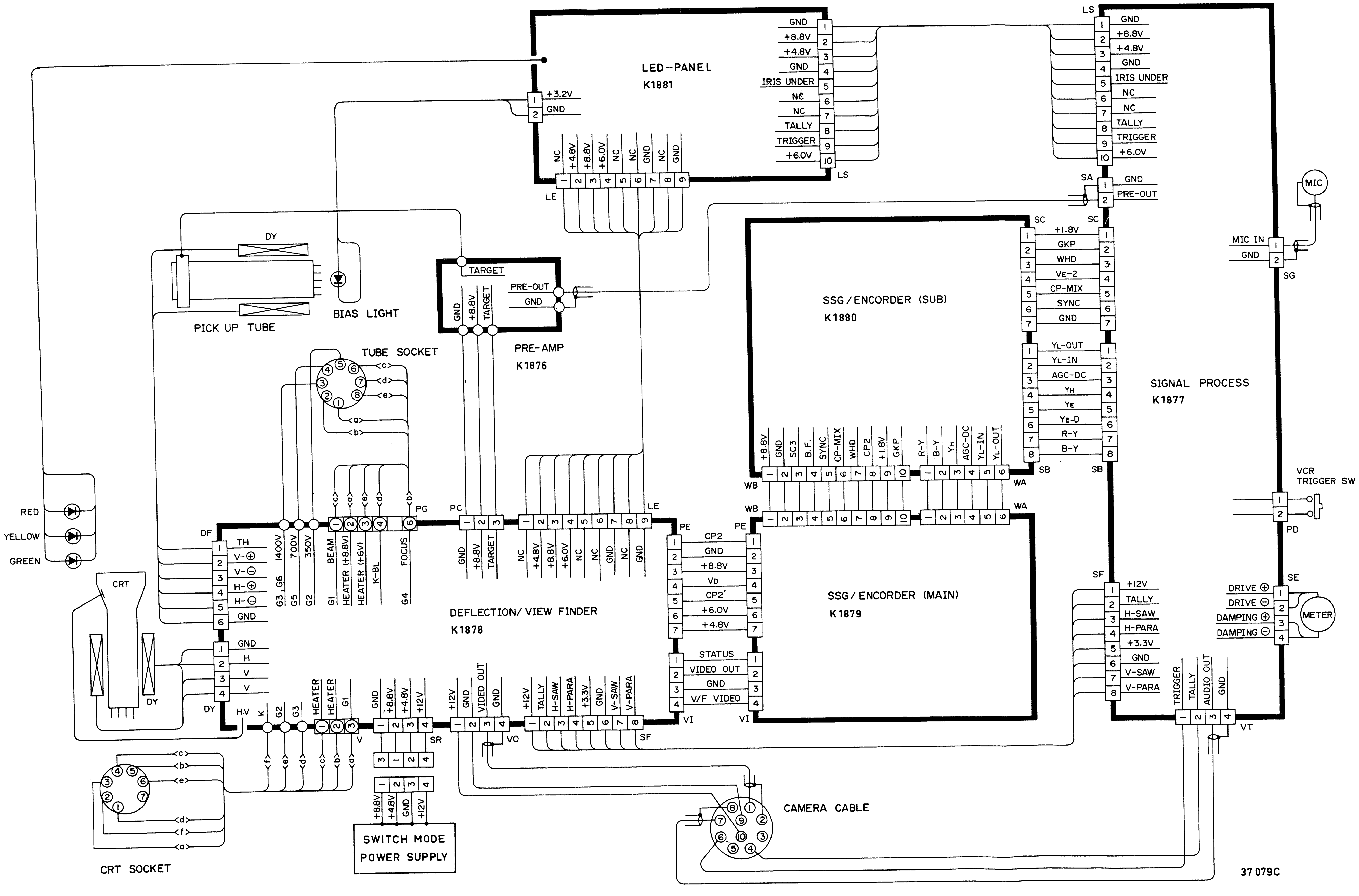
MA151K
MA152K

37077B

BLOCK DIAGRAM


CAMERA DEFLECTION
HD
-1
LIN. CORR.
H
BEAM BLANKING
VD
G 50Hz
V
VT
SIGNAL PROCESSING
U/O (RED)
DIAPHRAGM
PRE-AMP.
EF
CP
3.9MHz
1.2MHz
TR
SHADING
D
R
B
CORR.
COLOUR DETECTION
3.9MHz
EF
φ90°
64μs
YE1
+
−
R-Y
B-Y
YL
1.1MHz
0.8μs
YH
YE
450ns
3.4MHz
64μs
1.1MHz
Σ
YE1
290ns
YE2
PAL ENCODER
SC1
SC2
BF
CBL
1.1MHz
64μs
CVBS OUT
4.43 MHz
VBS TO EVF
CS
ELECTRONIC VIEWFINDER
VBS
G 50Hz
φ
G 15625Hz
V
H
H. T.
SYNC. SIGNAL GENERATOR
17.73MHz
G
:4
90
270
180
SC1
SC2
:648
φ
:161
4.4
G
H/2
PULSE GEN.
CS
VD
BF
WHD
CP2
CP1
CBL
WBL
AUDIO
MIC
AUDIO OUT
TRIGGER SWITCH
SYSTEM SWITCH
TRIGGER OUT
1
Vref
+12
=1
G 2Hz
STATUS
TRIGGER (YELLOW)
CVBS
STATUS (GREEN)
PRS. 00194

WIRING DIAGRAM


LED-PANEL
K1881
GND
+8.8V
+4.8V
GND
IRIS UNDER
NC
NC
TALLY
TRIGGER
+6.0V
LS
+3.2V
GND
NC
+4.8V
+8.8V
+6.0V
NC
NC
GND
NC
GND
LE
LS
GND
+8.8V
+4.8V
GND
IRIS UNDER
NC
NC
TALLY
TRIGGER
+6.0V
SA
GND
PRE-OUT
MIC
MIC IN
GND
SG
DY
BIAS LIGHT
PICK UP TUBE
TARGET
PRE-OUT
GND
GND
+8.8V
TARGET
PRE-AMP
K1876
TUBE SOCKET
SSG/ENCORDER (SUB)
K1880
SC
+1.8V
GKP
WHD
VE-2
CP-MIX
SYNC
GND
YL-OUT
YL-IN
AGC-DC
YH
YE
YE-D
R-Y
B-Y
SIGNAL PROCESS
K1877
+8.8V
GND
SC3
B.F.
SYNC
CP-MIX
WHD
CP2
+1.8V
GKP
R-Y
B-Y
YH
AGC-DC
YL-IN
YL-OUT
WB
WA
SB
VCR TRIGGER SW
PD
RED
YELLOW
GREEN
CRT
DF
TH
V-⊕
V-⊖
H-⊕
H-⊖
GND
1400V
700V
350V
BEAM
HEATER (+8.8V)
HEATER (+6V)
K-BL
FOCUS
G3, G6
G5
G2
G1
G4
PG
PC
GND
+8.8V
TARGET
NC
+4.8V
+8.8V
+6.0V
NC
GND
NC
GND
LE
PE
CP2
GND
+8.8V
VD
CP2'
+6.0V
+4.8V
SSG/ENCORDER (MAIN)
K1879
DEFLECTION/VIEW FINDER
K1878
STATUS
VIDEO OUT
GND
V/F VIDEO
VI
SF
+12V
TALLY
H-SAW
H-PARA
+3.3V
GND
V-SAW
V-PARA
SE
DRIVE ⊕
DRIVE ⊖
DAMPING ⊕
DAMPING ⊖
METER
GND
H
V
V
DY
H.V
K
G2
G3
HEATER
HEATER
G1
V
GND
+8.8V
+4.8V
+12V
SR
+12V
GND
VIDEO OUT
GND
VO
+12V
TALLY
H-SAW
H-PARA
+3.3V
GND
V-SAW
V-PARA
SF
TRIGGER
TALLY
AUDIO OUT
GND
VT
+8.8V
+4.8V
GND
+12V
SWITCH MODE POWER SUPPLY
CAMERA CABLE
CRT SOCKET
37 079C

CHASSIS LAY-OUT

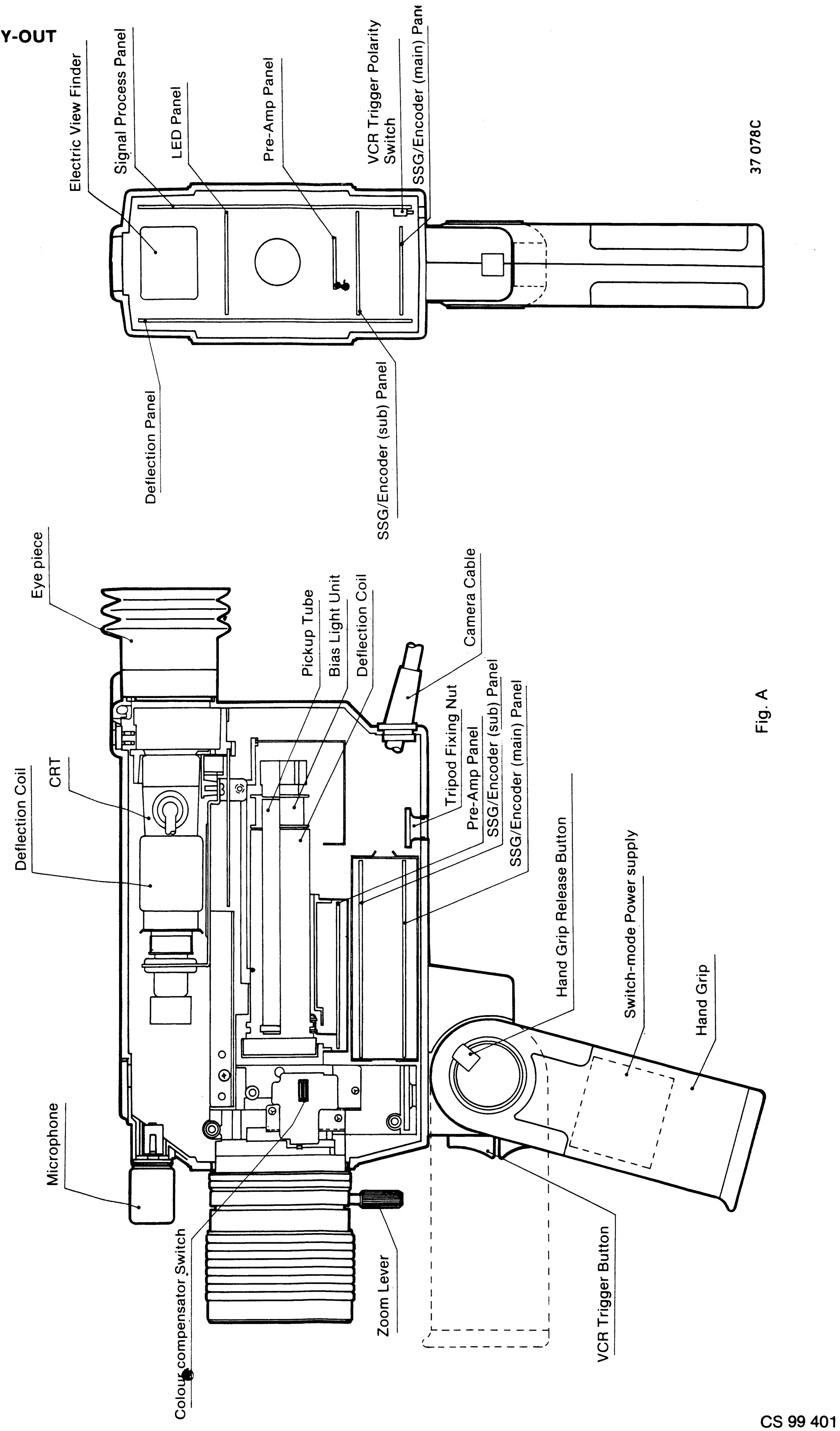

Electric View Finder
Signal Process Panel
LED Panel
Pre-Amp Panel
VCR Trigger Polarity Switch
SSG/Encoder (main) Pan
37 078C
Deflection Panel
SSG/Encoder (sub) Panel
Eye piece
Pickup Tube
Bias Light Unit
Deflection Coil
Camera Cable
Tripod Fixing Nut
Pre-Amp Panel
SSG/Encoder (sub) Panel
SSG/Encoder (main) Panel
Deflection Coil
CRT
Hand Grip Release Button
Switch-mode Power supply
Hand Grip
Microphone
Colour compensator Switch
Zoom Lever
VCR Trigger Button

Fig. A

Repeat the adjustment 6 until no further improvement can be reached.

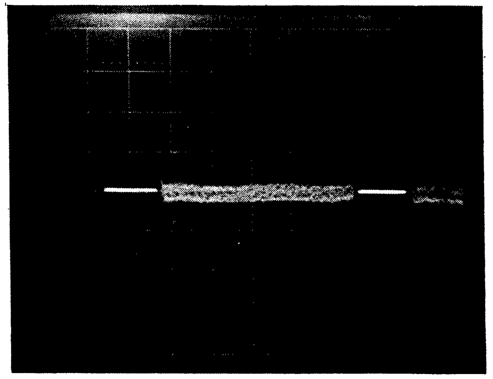


Fig. 4

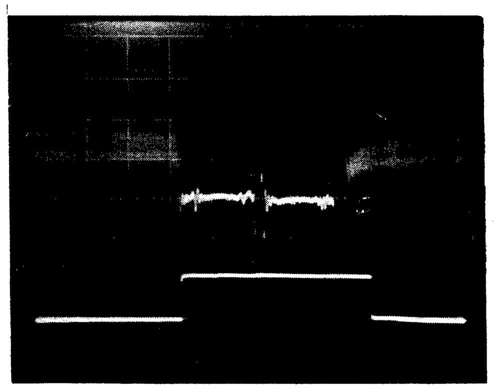


Fig. 5

7) Vertical size and position

Light box without slide.
Connect the oscilloscope to TP203.

- Adjust R610 for minimum beat in this signal. See Fig. 6.
- Short TP605 to earth.
- Adjust R613 so that the arrow on the target next to the optical black stripe coincides with the middle of the picture on the screen. See Fig. 7.
  Remove the short circuit.

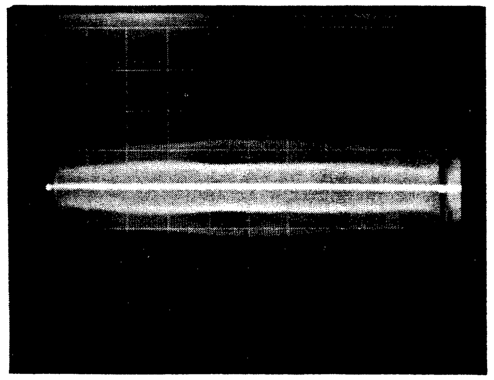


Fig. 6

Preset conditions

Before starting the following adjustments it is advised to minimize the correction signal, especially when colour shading must be cured.

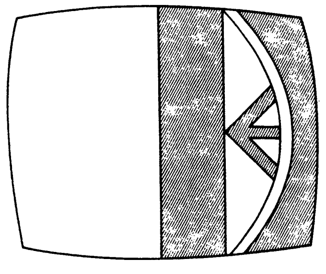


Fig. 7

a) Dynamic focus

Measure at TP903 and minimize the amplitude by means of R679 (DHP) and R680 (DHS) with horizontal triggering, and R681 (DVP) and R682 (DVS) with vertical triggering.

b) Shading

Measure at TP351 and minimize the signal by means of VR351-RVS-RVP- (vertical) and RHS-RHP (horizontal).
Measure at TP352 and minimize the signal by means of VR351 BVS-BVP (vertical) and BHS-BHP (horizontal).
Measure at TP353 and minimize the signal by means of VR351 DHS-DHP (horizontal), and at TP354 the signal is minimized by means of VR351 DVS-DVP (vertical).

c) AGC

Adjust R119 for maximum signal on TP103.

8) Bias light

Note:
The result of this adjustment may be influenzed by the horizontal dark shading. When this is the case, it is advised to adjust DHS and DHP of VR351 for minimum output on TP353.
Apply the lens cap.
Connect the oscilloscope to TP101 (pre-amp).
Trigger with V_D pulse on 4PE.
Adjust R781 so that the signal becomes 10 mV_{pp}. See Fig. 8.

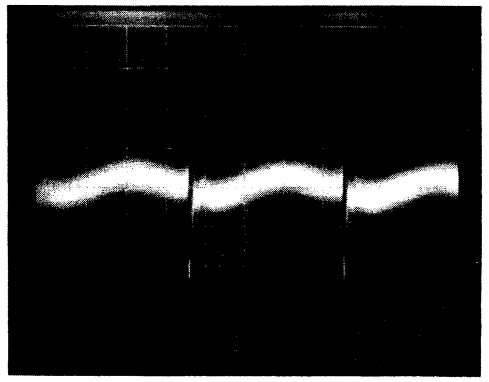


Fig. 8

9) Dark shading

Apply the lens cap.
Connect the oscilloscope to TP103.
Trigger with the CP2 pulse on 5PE.
Render the signal as flat as possible to zero with potmeters DHS and DHP of VR351.
Now trigger with the V_D pulse on 4PE.
Render the signal as flat as possible to zero with potmeters DVS and DVP of VR351.
See Fig. 9.

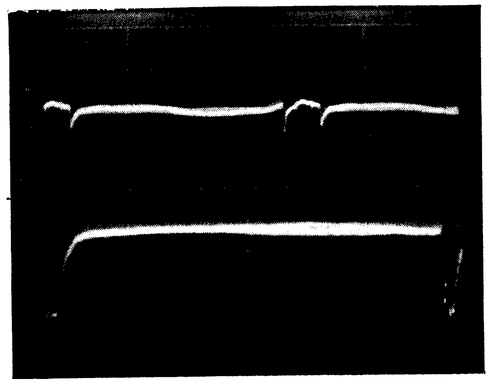


Fig. 9

10) Set up

Apply the lens cap.
Connect the oscilloscope to TP103.
Trigger with the CP2 pulse on 5PE.
Adjust R107 so that the output signal equals zero. See Fig. 10.

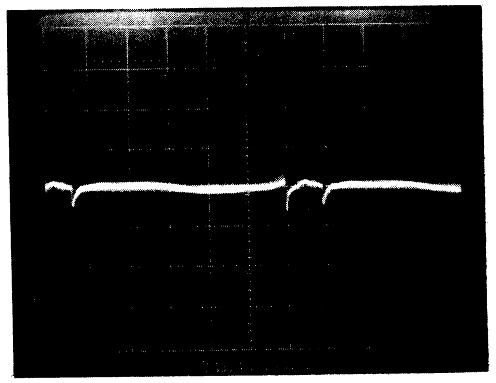


Fig. 10

11) AGC

Light box with grey scale slide, with a picture width of 75%.
Connect the oscilloscope to TP103, trigger with CP2 on 5PE.
Adjust R119 for a signal of 520 mV_{pp} with respect to black level. See Fig. 11.

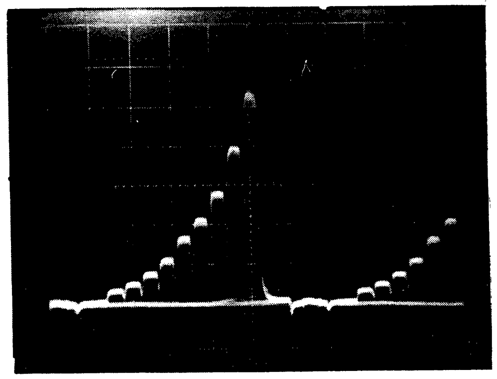


Fig. 11

12) Y_L-Pedestal

Light box with grey scale slide.
Connect the oscilloscope to TP299.
Trigger with the CP2 pulse on 5PE.
Adjust R451 so that the lowest grey level equals zero. See Fig. 12.

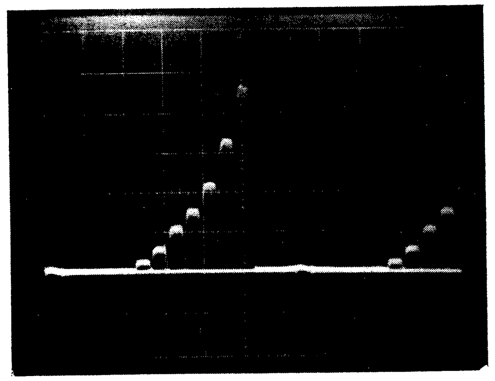


Fig. 12

13) V-edge signal

Light box with grey scale slide.
Connect the oscilloscope to TP204, trigger with the CP2 pulse on 5PE.
Adjust R212 so that the signal becomes zero.
See Fig. 13.

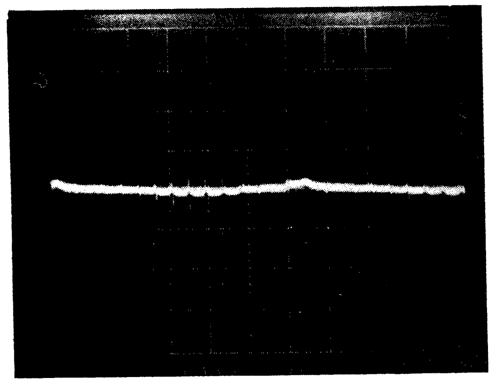


Fig. 13

14) R/B carrier gain

Light box with grey scale slide.
Connect the oscilloscope to TP203, triggered with the CP2 pulse on 5PE.
Adjust R202 for a signal of 360 mV_{pp}. See Fig. 14.

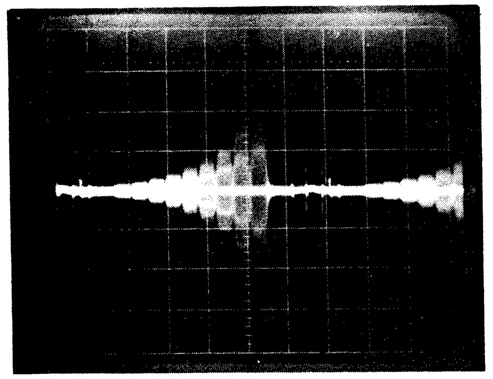


Fig. 14

15) R-gain, B-gain

Light box with grey scale slide.
Connect the oscilloscope to TP207 (R-Y), triggered with the CP2 pulse on 5PE.
Adjust R266 (R-gain) so that the level of the 5th bar becomes zero.
Connect the oscilloscope to TP217 (B-Y).
Adjust R228 (B-gain) so that the level of the 5th bar becomes zero. See Fig. 15.

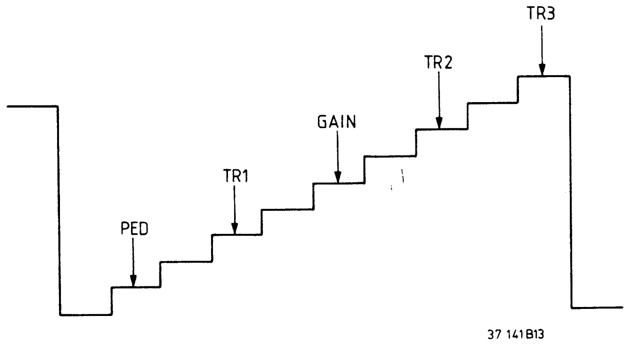


Fig. 15

16) Colour separation

Light box with grey scale slide.
Connect channel A to TP207 (R-Y) and channel B to TP217 (B-Y).
Trigger with CP2 pulse on 5PE.
Interconnect TP206 and TP208.
Adjust R219 and R209 for minimum jitter in both signals. See Fig. 16.
Disconnect TP206 and TP208.

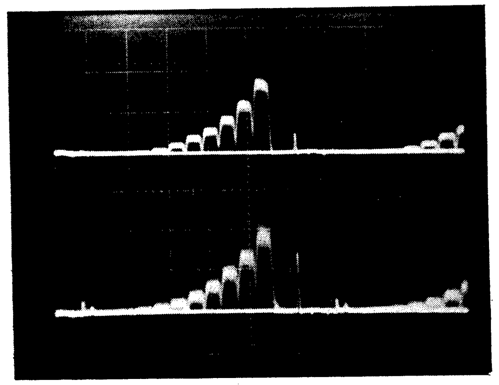


Fig. 16

17) Dynamic focus and colour shading

Light box without slide.
Check on static focus adjustment:
Adjust R918 so that the signal on TP203 is maximum.
Connect channel A of the oscilloscope to TP207 and channel B to TP217.
Trigger to CP2 pulse on 5PE.
Adjust R679 (DFHP) and R680 (DFHS) for minimum signal on both channels.
Trigger with the V_D pulse on 4PE.
Adjust R681 (DFVP) and R682 (DFVS) for minimum signal on both channels.
Trigger with the CP2 pulse on 5PE.
Adjust R351 RHS and RHP for minimum signal on TP207.
Adjust R351 BHS and BHP for minimum signal on TP217.
Trigger with the V_D pulse on 4PE.
Adjust R351 RVS and RVP for minimum signal on TP207.
Adjust R351 BVS and BVP for minimum signal on TP217. See Fig. 17.

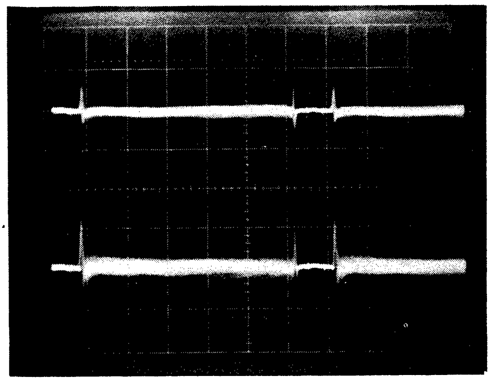


Fig. 17

18) Red gain, pedestal and tracking

Light box with grey scale slide.
Connect the oscilloscope to TP207 (R-Y).
Trigger with the CP2 pulse on 5PE.
Adjust R266 (R-gain) so that the 5th bar of the grey scale becomes zero.
Adjust R263 (R-Ped) so that the 1st bar of the grey scale becomes zero (is set at zero).
Adjust R239 (R-TR1) so that the 3rd bar of the grey scale becomes zero.
Adjust R240 (R-TR2) so that the 7th bar becomes zero.
Adjust R241 (R-TR3) so that the 9th bar becomes zero.
See Fig. 15.
Repeat the above adjustment until no further improvement can be obtained.

19) Blue gain pedestal and tracking

Light box with grey scale slide.
Connect the oscilloscope to TP217 (B-Y).
Trigger with the CP2 pulse on 5PE.
Adjust R228 (B-gain) so that the 5th bar of the grey scale becomes zero.
Adjust R252 (B-Ped) so that the 1st bar of the grey scale becomes zero (is set at zero).
Adjust R230 (B-TR1) so that the 3rd bar of the grey scale becomes zero.
Adjust R231 (B-TR2) so that the 7th bar of the grey scale becomes zero.
Adjust R232 (B-TR3) so that the 9th bar of the grey scale becomes zero. See Fig. 15.
Repeat the above adjustments until no further improvement can be obtained. See Fig. 18.

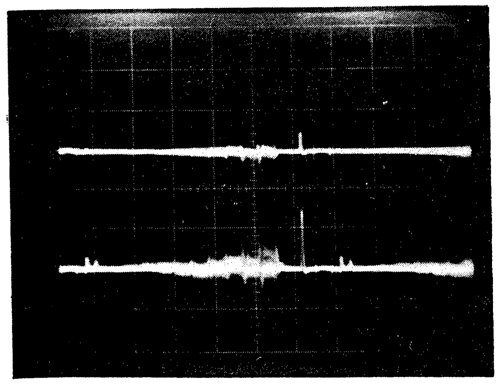


Fig. 18

20) R

Apply
Conn
Trigg
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21) Y

Light
Conn
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Adjus
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Note

The f
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22) B

Light
Selec
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Adjus
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23) C

Light
Selec
Adjus
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Adjus
Adjus
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Adjus
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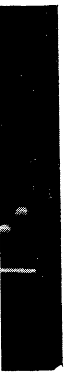

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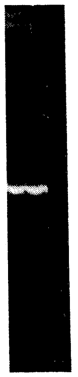

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15) R-gain, B-gain

Light box with grey scale slide.
Connect the oscilloscope to TP207 (R-Y), triggered with the CP2 pulse on 5PE.
Adjust R266 (R-gain) so that the level of the 5th bar becomes zero.
Connect the oscilloscope to TP217 (B-Y).
Adjust R228 (B-gain) so that the level of the 5th bar becomes zero. See Fig. 15.

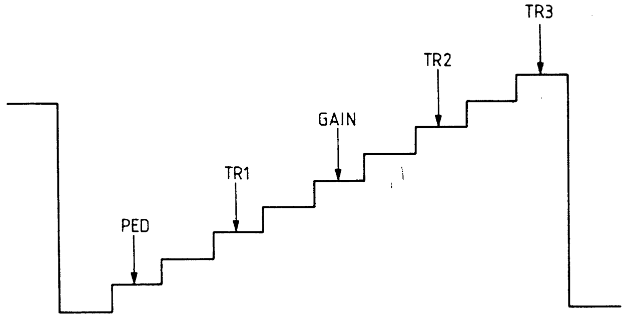


Fig. 15

16) Colour separation

Light box with grey scale slide.
Connect channel A to TP207 (R-Y) and channel B to TP217 (B-Y).
Trigger with CP2 pulse on 5PE.
Interconnect TP206 and TP208.
Adjust R219 and R209 for minimum jitter in both signals. See Fig. 16.
Disconnect TP206 and TP208.

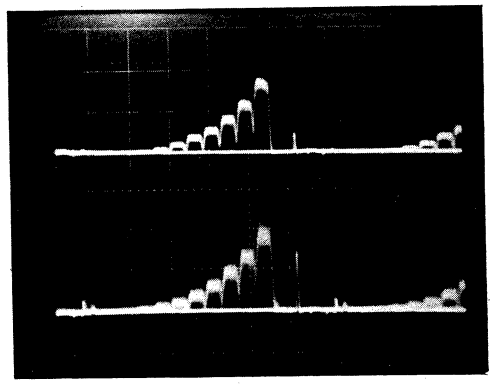


Fig. 16

17) Dynamic focus and colour shading

Light box without slide.
Check on static focus adjustment:
Adjust R918 so that the signal on TP203 is maximum.
Connect channel A of the oscilloscope to TP207 and channel B to TP217.
Trigger to CP2 pulse on 5PE.
Adjust R679 (DFHP) and R680 (DFHS) for minimum signal on both channels.
Trigger with the V_D pulse on 4PE.
Adjust R681 (DFVP) and R682 (DFVS) for minimum signal on both channels.
Trigger with the CP2 pulse on 5PE.
Adjust R351 RHS and RHP for minimum signal on TP207.
Adjust R351 BHS and BHP for minimum signal on TP217.
Trigger with the V_D pulse on 4PE.
Adjust R351 RVS and RVP for minimum signal on TP207.
Adjust R351 BVS and BVP for minimum signal on TP217. See Fig. 17.

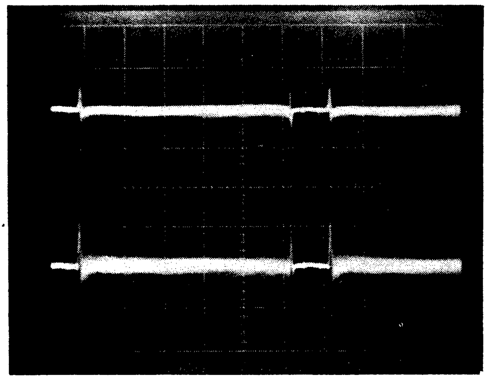


Fig. 17

18) Red gain, pedestal and tracking

Light box with grey scale slide.
Connect the oscilloscope to TP207 (R-Y).
Trigger with the CP2 pulse on 5PE.
Adjust R266 (R-gain) so that the 5th bar of the grey scale becomes zero.
Adjust R263 (R-Ped) so that the 1st bar of the grey scale becomes zero (is set at zero).
Adjust R239 (R-TR1) so that the 3rd bar of the grey scale becomes zero.
Adjust R240 (R-TR2) so that the 7th bar becomes zero.
Adjust R241 (R-TR3) so that the 9th bar becomes zero.
See Fig. 15.
Repeat the above adjustment until no further improvement can be obtained.

19) Blue gain pedestal and tracking

Light box with grey scale slide.
Connect the oscilloscope to TP217 (B-Y).
Trigger with the CP2 pulse on 5PE.
Adjust R228 (B-gain) so that the 5th bar of the grey scale becomes zero.
Adjust R252 (B-Ped) so that the 1st bar of the grey scale becomes zero (is set at zero).
Adjust R230 (B-TR1) so that the 3rd bar of the grey scale becomes zero.
Adjust R231 (B-TR2) so that the 7th bar of the grey scale becomes zero.
Adjust R232 (B-TR3) so that the 9th bar of the grey scale becomes zero. See Fig. 15.
Repeat the above adjustments until no further improvement can be obtained. See Fig. 18.

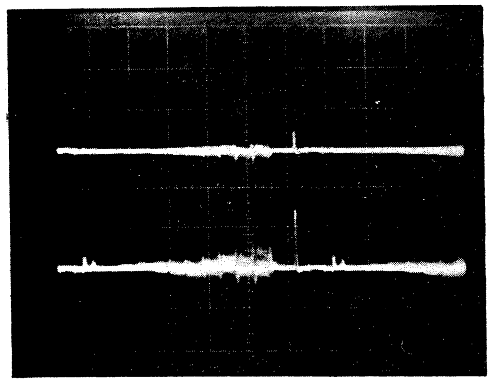


Fig. 18

20) Red colourbalance and Blue colourbalance

Apply the lenscap.
Connect the oscilloscope to the CVBS signal.
Trigger with the CP2 pulse on 5PE.
Adjust R320 (R-C/B) and R321 (B-C/B) for minimum chroma carrier on the CVBS signal.

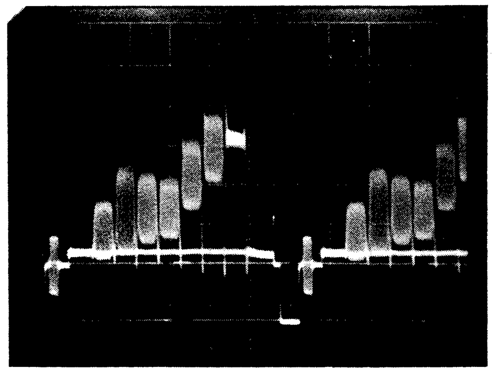


Fig. 19

21) Y_H level

Light box with grey scale slide.
Connect the oscilloscope to the CVBS output terminated with 75 Ω.
Adjust R158 (Y_H-level) so that the output of the 9th bar (white) is 700 mV above blanking level.

Note

The following adjustments can only be carried out correctly with the aid of a vector scope.
It must be connected to the CVBS output of the cable drum, terminated with 75 Ω.

22) Burst phase - Burst level

Light box with colour bar chart.
Select the PAL-mode on the vectorscope.
Adjust R438 (burst phase) so that the two burst vectors are under 90° with respect to each other.
Adjust R436 (burst level) so that the amplitude of the vector reaches the 75%, mark.

23) Chroma phase - Chroma level - (R-Y) gain and (B-Y) gain

Light box with colour bar chart.
Select the +V mode on the vectorscope.
Adjust the blue vector to 190° with R435 (chroma phase).
Adjust the red vector to 80° with R258 (R-Y gain).
Adjust the red amplitude to 60% with R437 (chroma level).
Adjust the blue amplitude to 50% with R250 (B-Y gain).
Repeat the above adjustment until the Fig. 20 is obtained.

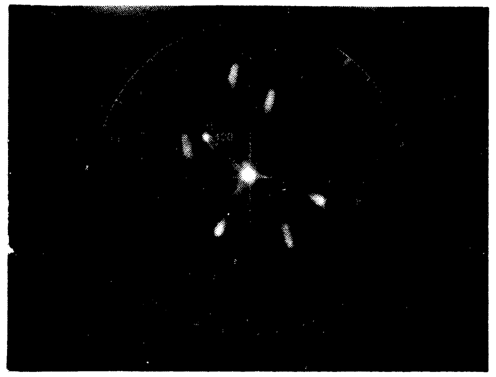


Fig. 20

24) Back focus

Light box with test circle slide.
Reduce the light level so that the CVBS output signal equals 400 mV_{pp} above blanking level. (Also the room illumination may need reduction!!).
Set the zoom ring to TELE position.
Adjust the focus ring for optimum focus.
Set the zoom ring 200 m to WIDE position.
After loosening the long allen screw the master lens can be adjusted for maximum focus with aid of a flat blade screw driver.
Check and eventually repeat for optimum result.

25) Iris-under indication

Light box with grey scale.
Reduce the light until the video signal becomes 525 mV_{pp}.
Turn R125 (Iris under) so that the red led extinguishes, and then slowly back until it just lights up.
Make sure that the led is off when the videosignal is 600 mV and is on when the signal is 450 mV.

26) Battery-alarm

Disconnect the camera from the cable drum 22AV5003 and apply an external supply voltage of 10.9 Volts.
Adjust R842 (Batt. alarm) so that the yellow led just starts flashing.
Make sure that the alarm is off at 11.0 V and on at 10.8 V supply voltage.

27) Electronic Viewfinder, adjustments

Connect a capacitor (100 μF - 10 V) between 4 VI and ground.
Adjust R905 (V-Hold) for a frequency of 47 Hz at TP904.
Adjust R911 (H-Hold) for a frequency of 15.625 Hz at TP905.
Remove the capacitor and shoot the test circle.
Adjust R902 (V-size) so that the circle on the VF picture tube is as round as possible.

MAINS SSG/ENCODER PANEL (solder side)

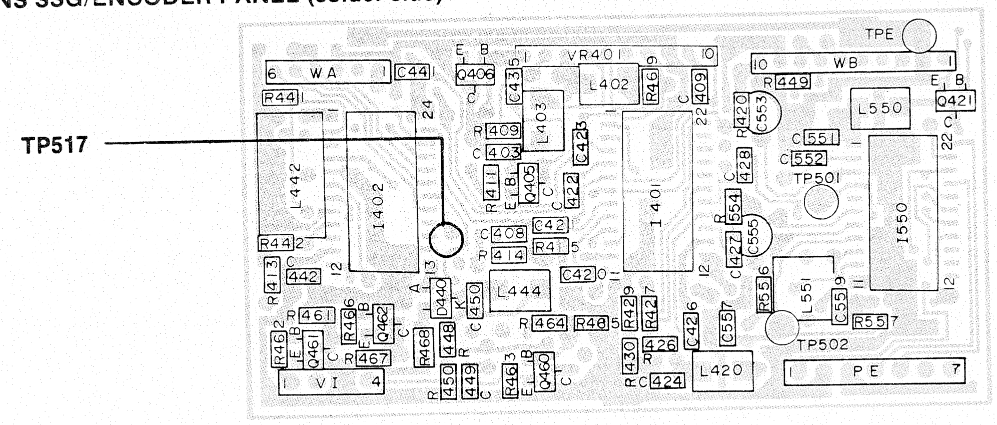

TP517
WA
WB
VR401
L402
I401
I402
L442
L550
I550
L444
L551
L420
TP501
TP502
TPE
VI
PE

Fig. D

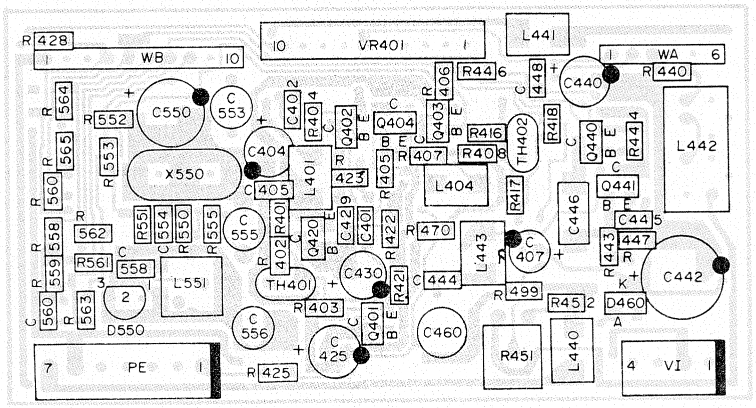

WB
VR401
L441
WA
C550
X550
L401
L404
L442
L443
L551
C442
C460
R451
L440
D550
PE
VI

Fig. E

SUB SSG/ENCODER PANEL (solder side)

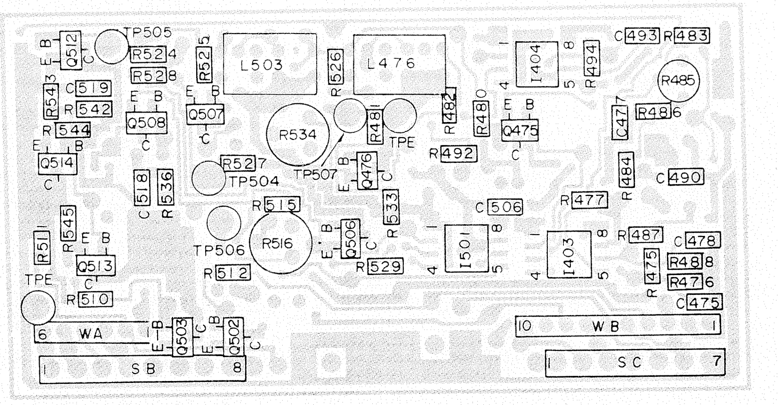

TP505
L503
L476
I404
R485
R534
R516
I501
I403
TP504
TP506
TP507
TPE
WA
WB
SB
SC

Fig. F

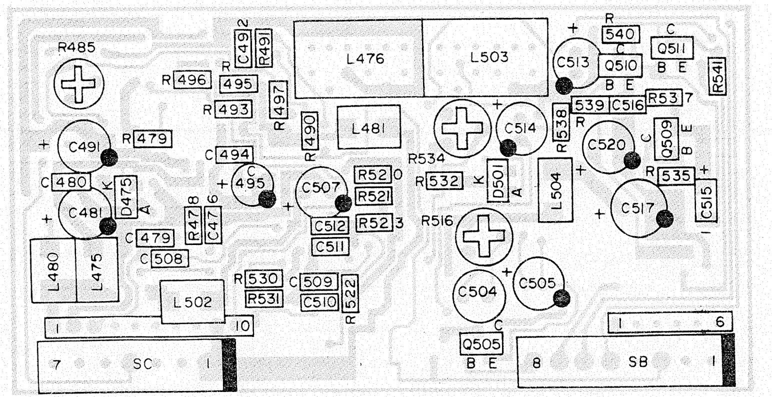

R485
L476
L503
L481
L480
L475
L502
L504
C504
C505
R534
R516
SC
SB

Fig. G

DEFLECTION PANEL (solder side)

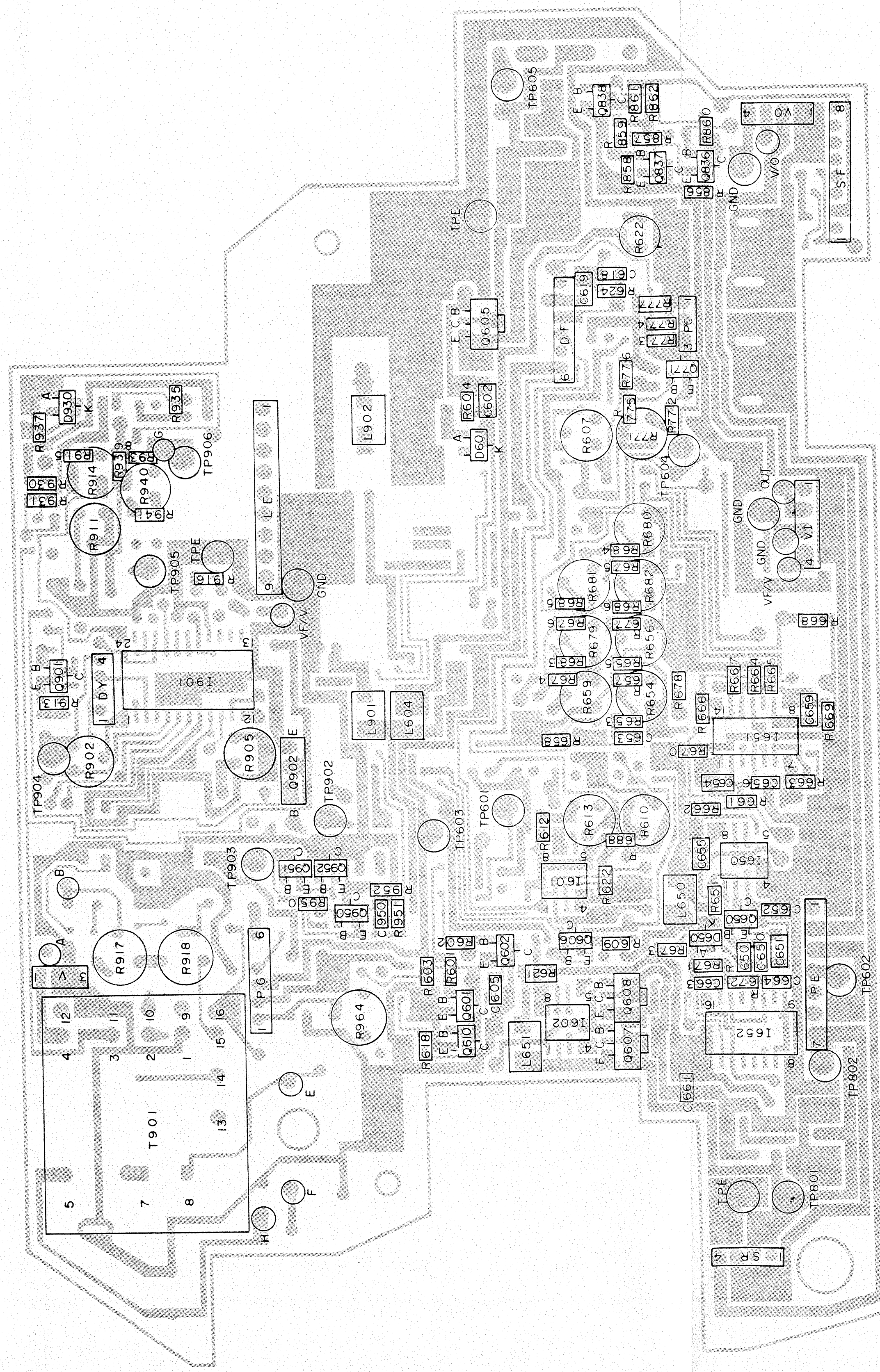
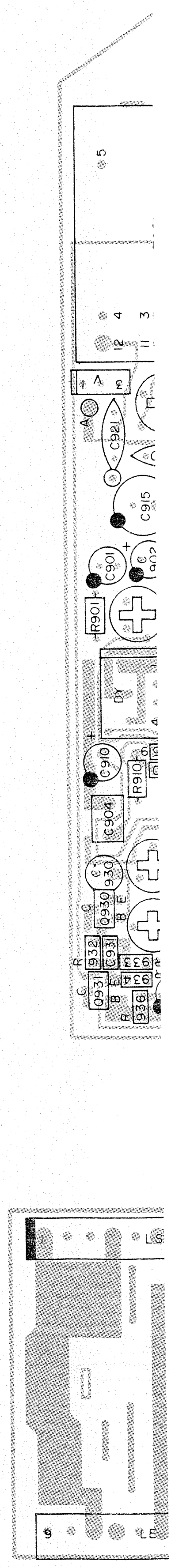
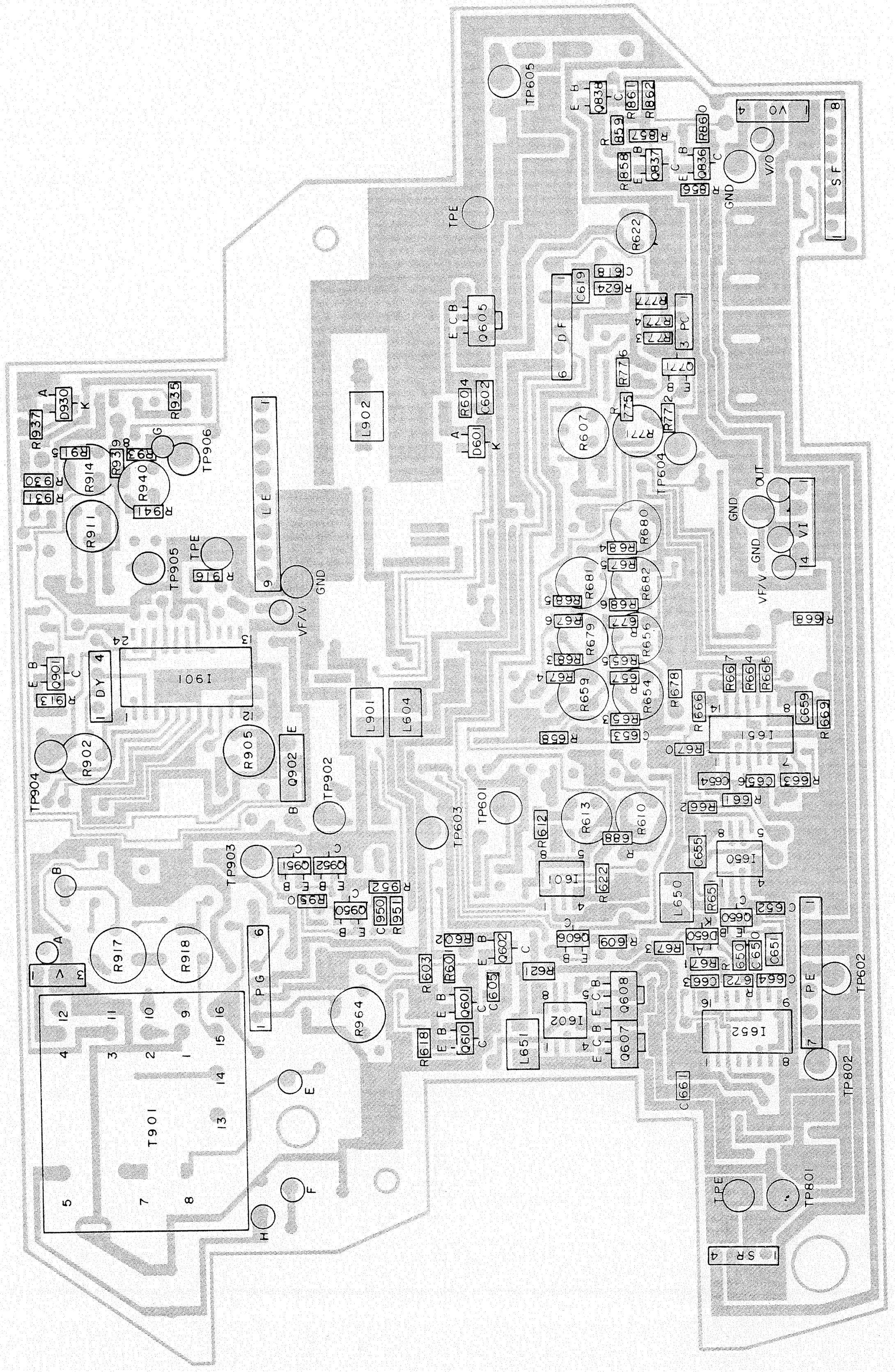

TP605
TPE
L902
I901
L901
L604
I601
I602
I650
I651
I652
L650
T901
R964
R917
R918
R911
R902
R905
TP904
TP905
TP906
TP902
TP903
TP601
TP603
TP604
TP602
TP802
TP801
DY
DF
LE
PG
PE
SF
VI
VO
SR

Fig. H

DEFLECTION PANEL (c


DY
C921
C915
C901
C910
C904
LS
LE

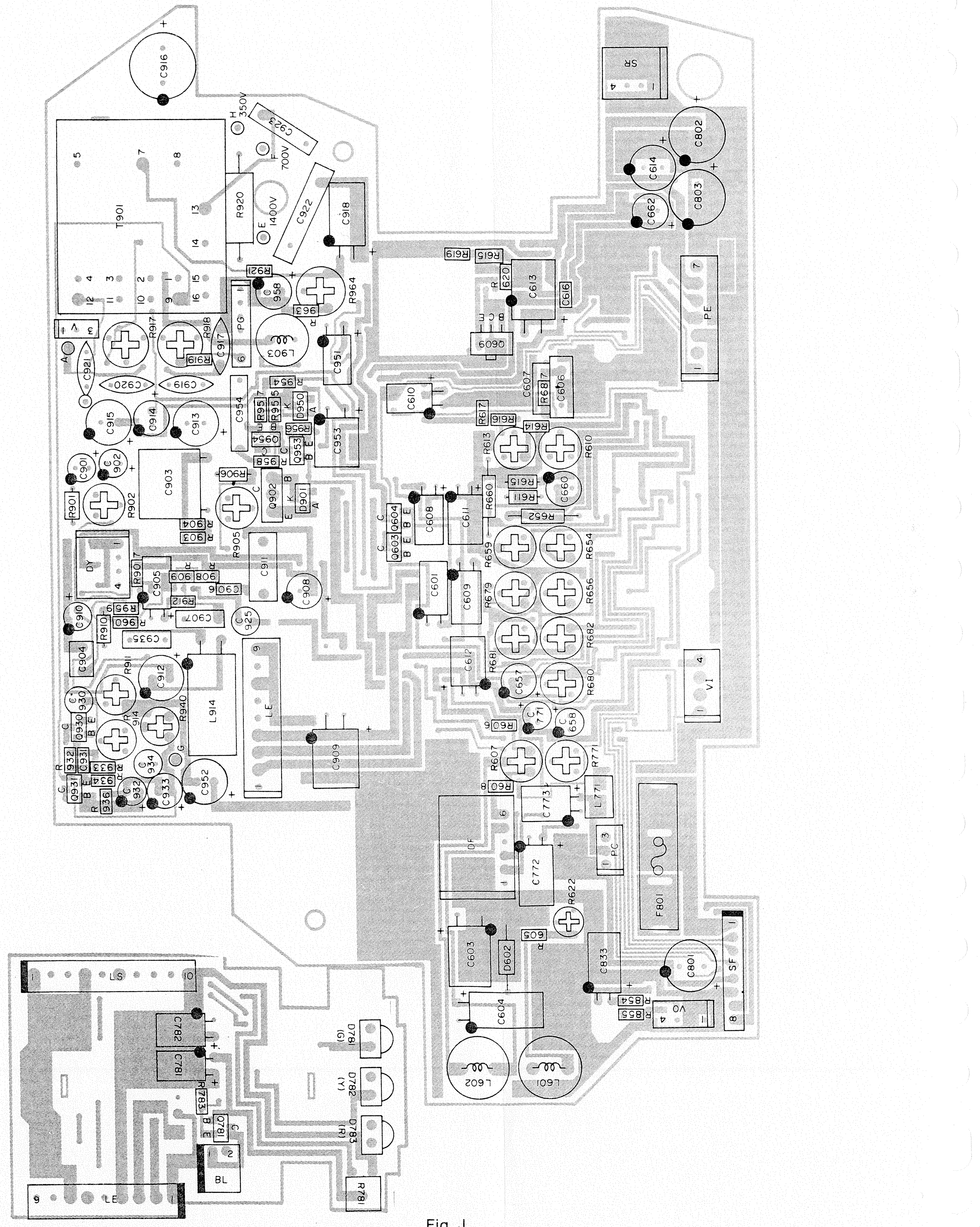
DEFLECTION PANEL (solder side)



TP605
TPE
R622
Q605
DF
L902
D601
R607
R771
TP604
VO
SF
V/O
GND
OUT
VI
VF/V
R937
D930
R935
R914
R940
TP906
R911
TP905
LE
I901
DY
Q901
R902
TP904
R905
Q902
TP902
TP903
TP603
TP601
R613
R610
R679
R659
R654
R656
R680
R681
R682
I651
I650
I601
I602
I652
L650
L651
L604
L901
R917
R918
PG
R964
T901
Q601
Q602
Q607
Q608
Q610
PE
TP602
TP802
TP801
SR
E
F
H

Fig. H

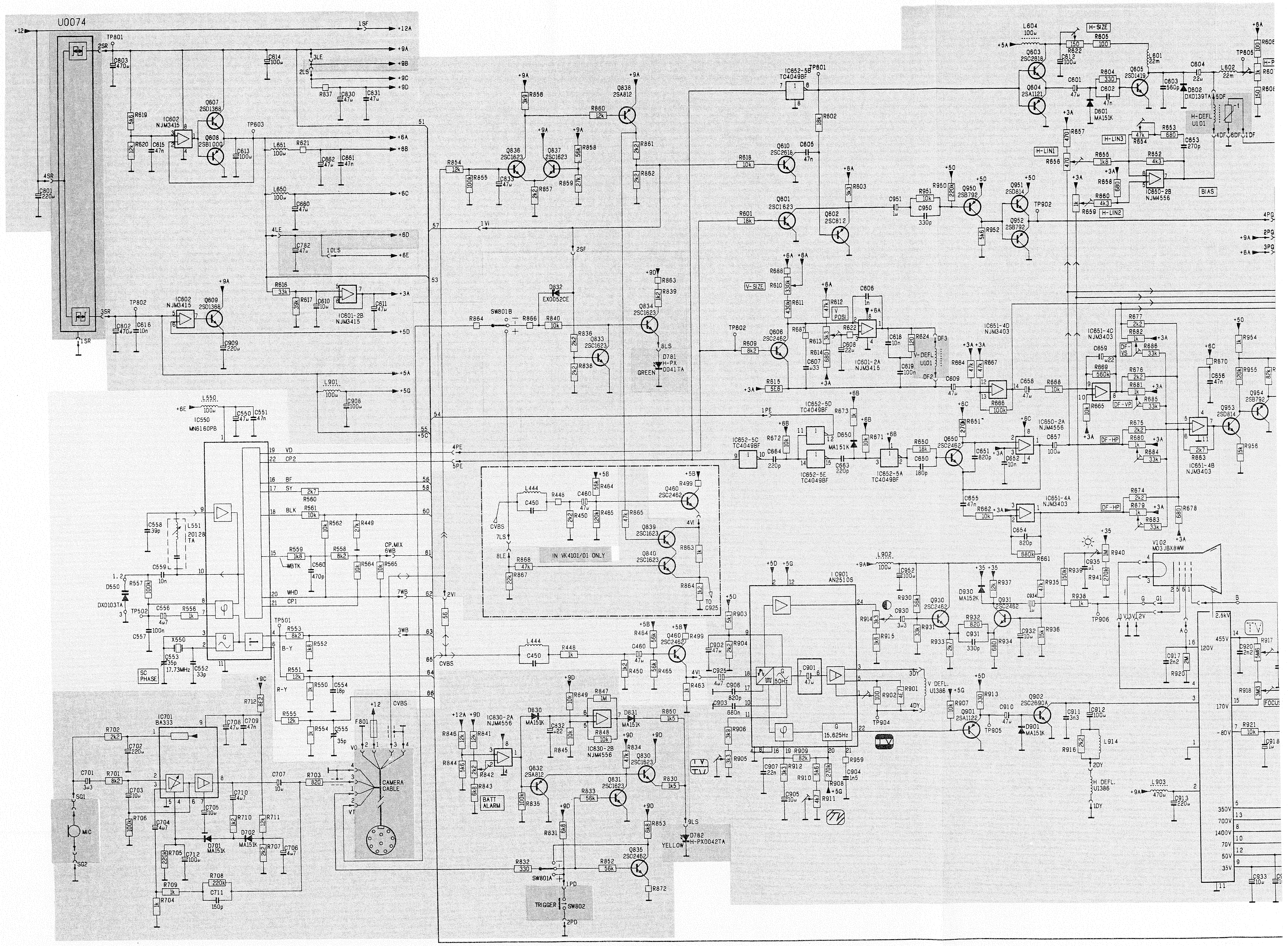
DEFLECTION PANEL (component side)



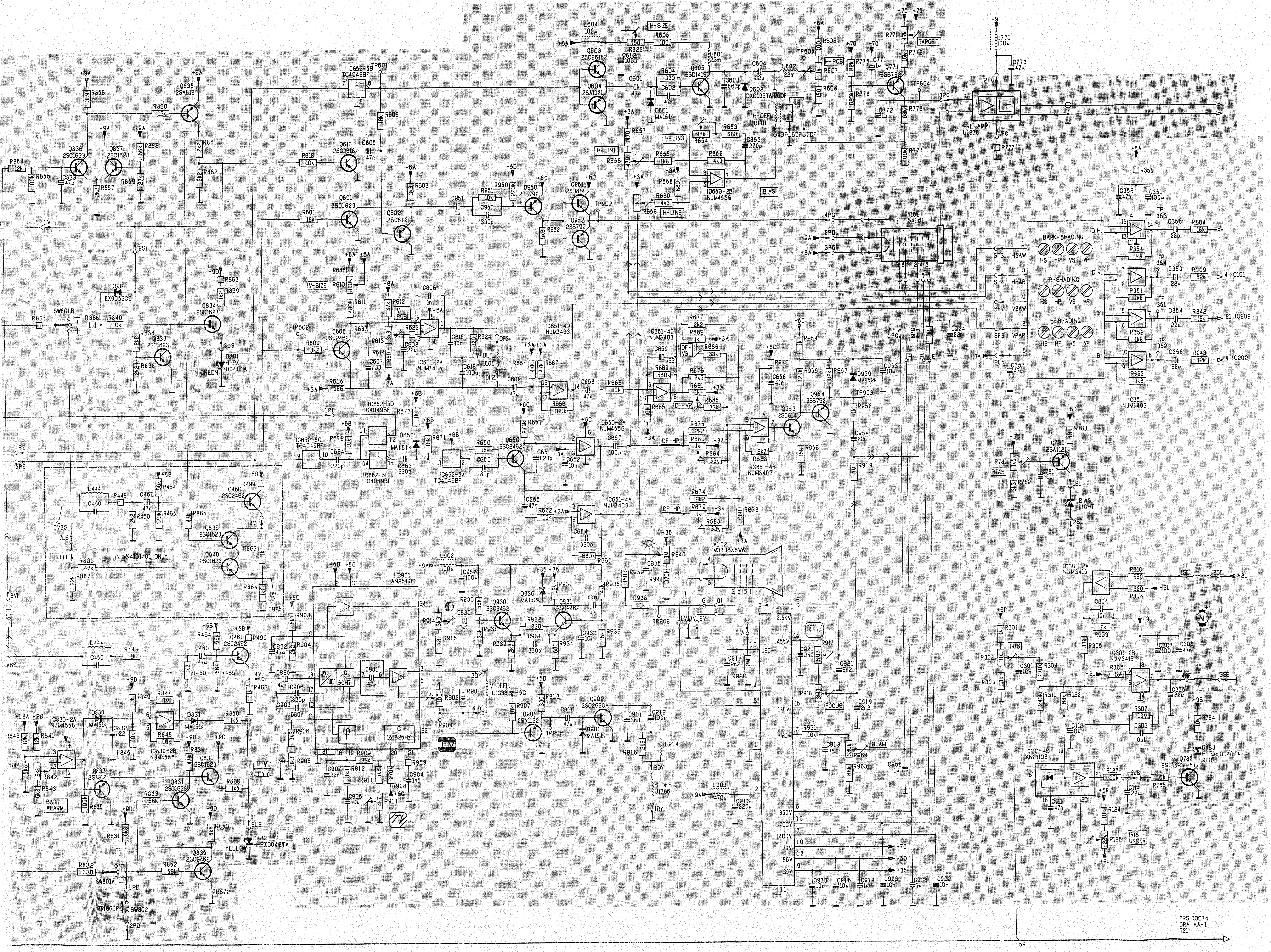
C916
350V
700V
1400V
C923
T901
R920
C922
C918
R921
C958
R964
C963
L903
R917
R918
R919
PG
C951
C981
C920
C919
C915
C914
C913
C954
R957
R955
Q950
Q954
Q953
C953
C901
C902
C903
R906
R901
R902
R905
Q902
Q901
R904
R903
DY
R9017
C905
C908
C911
C907
C910
R910
C904
C935
C925
R911
C912
R940
L914
LE
C930
C952
C933
C934
C909
SR
C802
C614
C662
C803
R619
R615
R620
C613
C616
Q609
PE
C610
C607
R687
C606
R617
R616
R614
R613
R610
C660
R611
R660
R652
C608
C611
Q603
Q604
C601
C609
R659
R654
R679
R656
R682
C612
R681
C657
R680
C771
C658
R771
R607
R608
C773
L771
C772
PC
F801
R622
C603
D602
R605
C833
C801
C604
R854
R855
VO
SF
L602
L601
VI
LS
C782
C781
R783
Q781
D781
D782
D783
(G)
(Y)
(R)
BL
R781

Fig. J

CIRCUIT DIAGRAM A

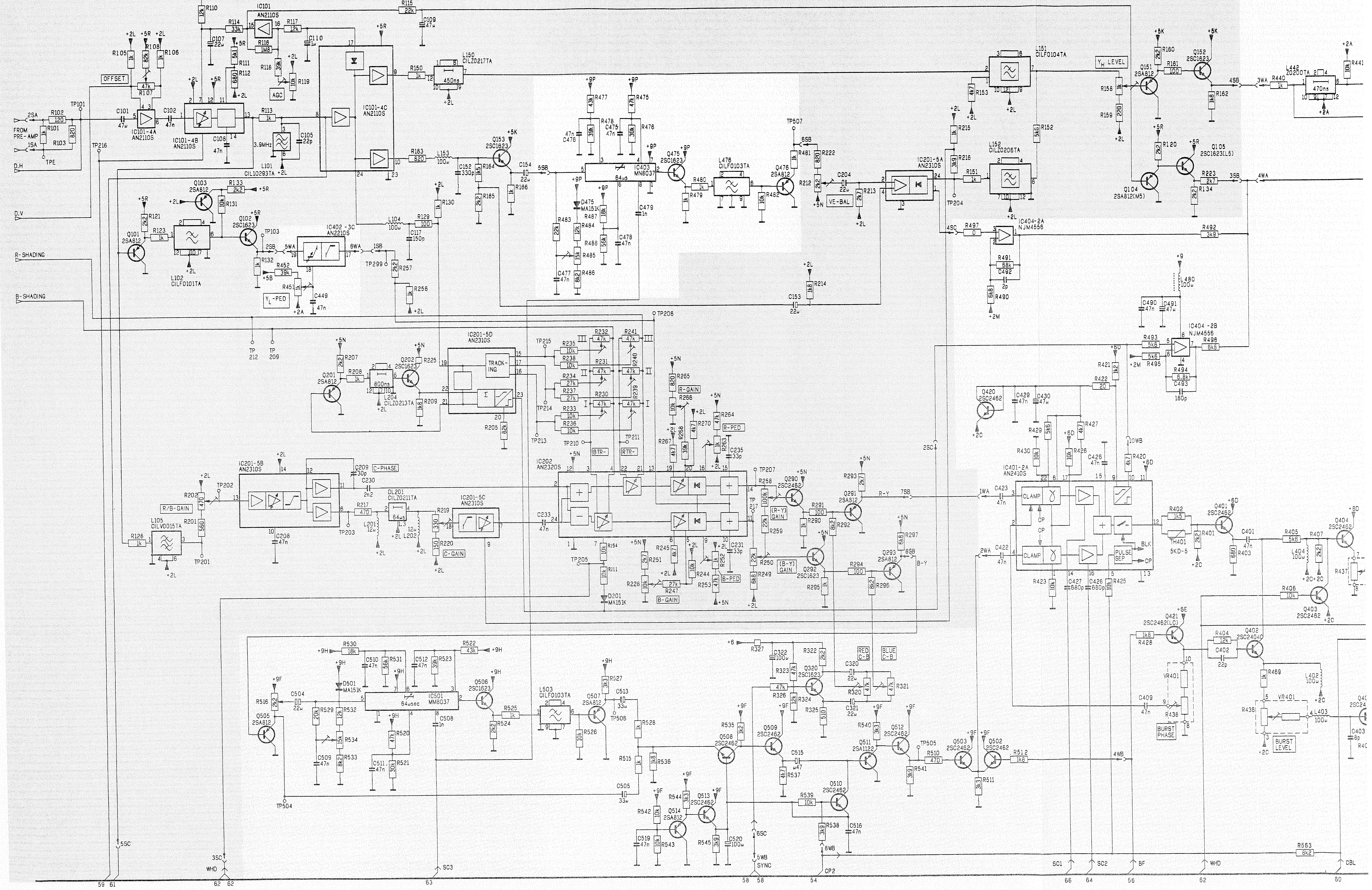

U0074
TP801
TP802
IC602 NJM3415
Q607 2SD1368
Q608 2SB1000
Q609 2SD1368
TP603
L651 100µ
L650 100µ
IC601-2B NJM3415
+12A
+9A
+9B
+9C
+9D
+6A
+6B
+6C
+6D
+6E
+3A
+5D
+5A
+5G
+5C
IC550 MN6160PB
L550 100µ
L551 20128 TA
X550 17.73MHz
SC PHASE
D550 DX0103TA
TP502
TP501
VD
CP2
BF
SY
BLK
WBTK
WHD
CP1
B-Y
R-Y
CP.MIX
CVBS
IC701 BA333
MIC
SG1
SG2
D701 MA151K
D702 MA151K
CAMERA CABLE
F801
Q836 2SC1623
Q837 2SC1623
Q838 2SA812
Q834 2SC1623
Q833 2SC1623
SW801B
D832 EX0052CE
D781 H-PX 0D41TA
GREEN
L444
C450
Q460 2SC2462
Q839 2SC1623
Q840 2SC1623
IN VK4101/01 ONLY
IC830-2A NJM4556
IC830-2B NJM4556
D830 MA151K
D831 MA151K
Q832 2SA812
Q830 2SC1623
Q831 2SC1623
Q835 2SC2462
D782 H-PX0042TA
YELLOW
BATT ALARM
SW801A
TRIGGER
SW802
IC652-5B TC4049BF
Q610 2SC2616
Q601 2SC1623
Q602 2SC812
Q950 2SB792
Q951 2SD814
Q952 2SB792
TP902
V-SIZE
V POSI
IC601-2A NJM3415
V-DEFL U101
IC652-5D TC4049BF
IC652-5C TC4049BF
IC652-5E TC4049BF
IC652-5A TC4049BF
D650 MA151K
Q650 2SC2462
IC650-2A NJM4556
IC651-4D NJM3403
IC651-4C NJM3403
IC651-4B NJM3403
IC651-4A NJM3403
DF-VS
DF-VP
DF-HP
Q953 2SD814
Q954 2SB792
L604 100µ
H-SIZE
Q603 2SC2616
Q604 2SA1121
Q605 2SD1419
D601 MA151K
D602 DX0139TA
L601 22m
L602 22m
H-DEFL U101
H-LIN1
H-LIN2
H-LIN3
IC650-2B NJM4556
BIAS
TP805
IC901 AN2510S
Q930 2SC2462
Q931 2SC2462
D930 MA152K
V DEFL. U1386
Q901 2SA1122
Q902 2SC2690A
D901 MA151K
TP904
TP905
TP906
L914
H DEFL. U1386
L903 470µ
L902 100µ
V102 M03JBX8WW
15.625Hz
50Hz
2.5kV
455V
120V
170V
-80V
350V
700V
1400V
70V
50V
35V
FOCUS

CIRCUIT DIAGRAM A

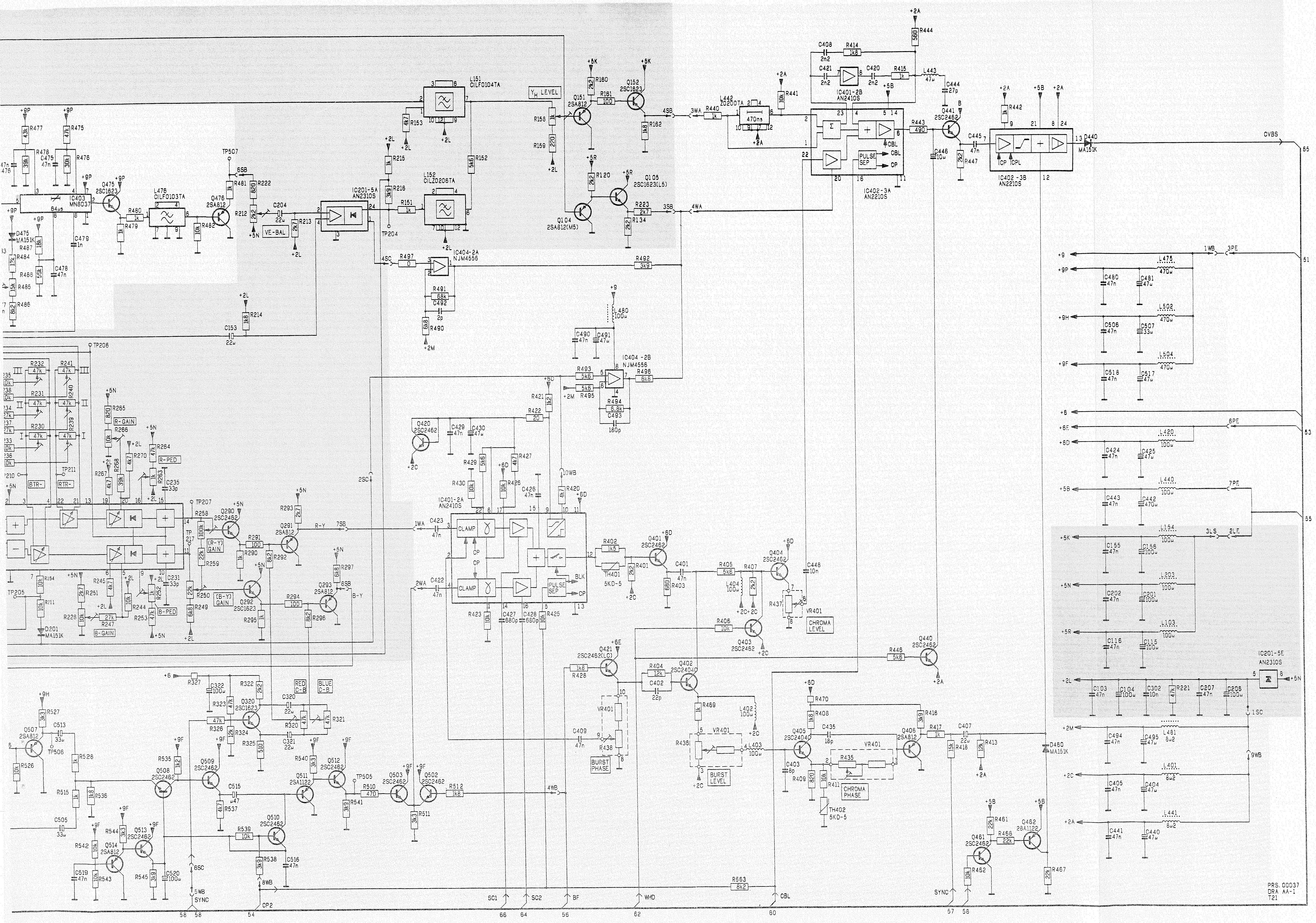


H-SIZE
L604 100µ
Q603 2SC2618
Q604 2SA1121
Q605 2SD1419
D601 MA151K
D602 DX0139TA
H-DEFL U101
H-LIN1
H-LIN3
H-LIN2
IC650-2B NJM4556
BIAS
H-POS
TARGET
Q771 2SB792
PRE-AMP U1676
IC652-5B TC4049BF
TP601
Q836 2SA812
Q836 2SC1623
Q837 2SC1623
Q610 2SC2616
Q601 2SC1623
Q602 2SC812
Q950 2SB792
Q951 2SD814
Q952 2SB792
TP902
V101 S4161
DARK-SHADING
R-SHADING
B-SHADING
HS HP VS VP
SF3 HSAW
SF4 HPAR
SF7 VSAW
SF8 VPAR
SF5
D.H.
D.V.
IC351 NJM3403
4 IC101
21 IC202
4 IC202
D832 EX0052CE
Q834 2SC1623
Q833 2SC1623
D781 H-PX 0041TA
GREEN
SW801B
V-SIZE
V POSI
TP802
Q606 2SC2462
IC601-2A NJM3415
V-DEFL U101
IC651-4D NJM3403
IC651-4C NJM3403
DF-VS
DF-VP
DF-HP
Q953 2SD814
Q954 2SB792
D950 MA152K
TP903
IC652-5D TC4049BF
IC652-5C TC4049BF
IC652-5E TC4049BF
IC652-5A TC4049BF
D650 MA151K
Q650 2SC2462
IC650-2A NJM4556
IC651-4B NJM3403
IC651-4A NJM3403
Q781 2SA1121
BIAS LIGHT
4PE
5PE
1PE
1VI
2SF
CVBS
L444
C450
Q460 2SC2462
Q839 2SC1623
Q840 2SC1623
IN VK4101/01 ONLY
V102 M03JBX8WW
IC901 AN2510S
L902 100µ
Q930 2SC2462
Q931 2SC2462
D930 MA152K
TP906
V DEFL. U1386
TP904
Q901 2SA1122
Q902 2SC2690A
D901 MA151K
TP905
L914
H DEFL. U1386
L903 470µ
15,625Hz
50Hz
FOCUS
BEAM
2.5kV
455V
120V
170V
-80V
350V
700V
1400V
70V
50V
35V
+70
+50
+35
IC301-2A NJM3415
IC301-2B NJM3415
IRIS
IRIS UNDER
IC101-4D AN2110S
Q782 2SC1623(L5)
D783 H-PX-0040TA
RED
IC830-2A NJM4556
IC830-2B NJM4556
D830 MA151K
D831 MA151K
Q832 2SA812
Q831 2SC1623
Q830 2SC1623
Q835 2SC2462
D782 H-PX0042TA
YELLOW
BATT ALARM
SW801A
TRIGGER
SW802
1PD
2PD
VBS
PRS.00074 DRA AA-1 T21
59

CIRCUIT DIAGRAM B


FROM PRE-AMP
2SA
1SA
TPE
TP101
TP216
D.H
D.V
R-SHADING
B-SHADING
OFFSET
AGC
IC101 AN2110S
IC101-4A AN2110S
IC101-4B AN2110S
IC101-4C AN2110S
L101 CIL10293TA
3.9MHz
L150 CILZ0217TA
450ns
Q153 2SC1623
5SB
IC403 MN6037
64μs
D475 MA151K
Q475 2SC1623
L476 CILF0103TA
Q476 2SA812
TP507
6SB
VE-BAL
IC201-5A AN2310S
TP204
L151 CILF0104TA
L152 CILZ0206TA
YH LEVEL
Q151 2SA812
Q152 2SC1623
Q104 2SA812(M5)
Q105 2SC1623(L5)
4SB
3WA
4WA
L442 ZO200TA
470ns
IC404-2A NJM4556
IC404-2B NJM4556
4SC
L480 100μ
Q101 2SA812
Q102 2SC1623
Q103 2SA812
L102 CILF0101TA
IC402-3C AN2210S
TP103
YL-PED
TP299
5WA
6WA
1SB
2SB
TP206
TP 212
TP 209
IC201-5D AN2310S
TRACKING
Q201 2SA812
Q202 2SC1623
L204 CILZ0213TA
800ns
TP215
TP214
TP213
TP210
TP211
BTR-
RTR-
R-GAIN
R-PED
B-GAIN
B-PED
IC202 AN2320S
TP205
D201 MA151K
TP207
TP217
(R-Y) GAIN
(B-Y) GAIN
Q290 2SC2462
Q291 2SA812
Q292 2SC1623
Q293 2SA812
R-Y
B-Y
7SB
8SB
IC201-5B AN2310S
C-PHASE
R/B-GAIN
TP202
TP203
TP201
DL201 CILZ0211TA
64μs
L201
L202
IC201-5C AN2310S
C-GAIN
L105 CILV0015TA
2SC
1WA
2WA
Q420 2SC2462
IC401-2A AN2410S
CLAMP
PULSE SEP
BLK
CP
10WB
TH401 5KD-5
Q401 2SC2462
Q403 2SC2462
Q404 2SC2462
Q421 2SC2462(LC)
Q402 2SC2404O
VR401
BURST PHASE
BURST LEVEL
L402 100μ
L403 100μ
L404 100μ
IC501 MN6037
64μsec
D501 MA151K
Q505 2SA812
Q506 2SC1623
L503 CILF0103TA
Q507 2SA812
TP504
TP505
TP506
Q508 2SC2462
Q509 2SC2462
Q510 2SC2462
Q511 2SA1122
Q512 2SC2462
Q502 2SC2462
Q503 2SC2462
Q513 2SC2462
Q514 2SA812
Q320 2SC1623
RED C-B
BLUE C-B
4WB
8WB
6SC
5WB SYNC
5SC
3SC
WHD
SC3
CP2
SC1
SC2
BF
CBL
59 61
62 62
63
58 58
54
66
64
56
62
60

CS 99 406


IC403 MN8037
64μs
L476 CILF0103TA
Q475 2SC1623
Q476 2SA812
VE-BAL
IC201-5A AN2310S
L151 CILF0104TA
L152 CILZ0206TA
Y_H LEVEL
Q151 2SA812
Q152 2SC1623
Q104 2SA812(M5)
Q105 2SC1623(L5)
IC404-2A NJM4556
IC404-2B NJM4556
L442 ZC200TA
470ns
IC401-2B AN2410S
IC402-3A AN2210S
PULSE SEP
CBL
CP
Q441 2SC2462
IC402-3B AN2210S
ICP
ICPL
D440 MA151K
CVBS
R-GAIN
R-PED
B-PED
B-GAIN
(R-Y) GAIN
(B-Y) GAIN
BTR-
RTR-
Q290 2SC2462
Q291 2SA812
Q292 2SC1623
Q293 2SA812
R-Y
B-Y
Q420 2SC2462
IC401-2A AN2410S
CLAMP
BLK
TH401 5KD-5
Q401 2SC2462
Q404 2SC2462
Q403 2SC2462
VR401
CHROMA LEVEL
Q440 2SC2462
Q421 2SC2462(LC)
Q402 2SC2404
BURST PHASE
BURST LEVEL
Q405 2SC2404
Q406 2SA812
CHROMA PHASE
TH402 5KD-5
D460 MA151K
Q461 2SC2462
Q462 2SA1122
RED C-B
BLUE C-B
Q320 2SC1623
Q507 2SA812
Q508 2SC2462
Q509 2SC2462
Q510 2SC2462
Q511 2SA1122
Q512 2SC2462
Q513 2SC2462
Q514 2SA812
Q503 2SC2462
Q502 2SC2462
IC201-5E AN2310S
L475 470μ
L502 470μ
L504 470μ
L420 100μ
L440 100μ
L154 100μ
L203 100μ
L103 100μ
L481 8μ2
L401 8μ2
L441 8μ2
L480 100μ
SC1
SC2
BF
WHD
CBL
SYNC
CP2
5WB SYNC
55
51
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56
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64
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PRS. 00037
DRA AA-1
T21

PROCESSING PANEL (component side)

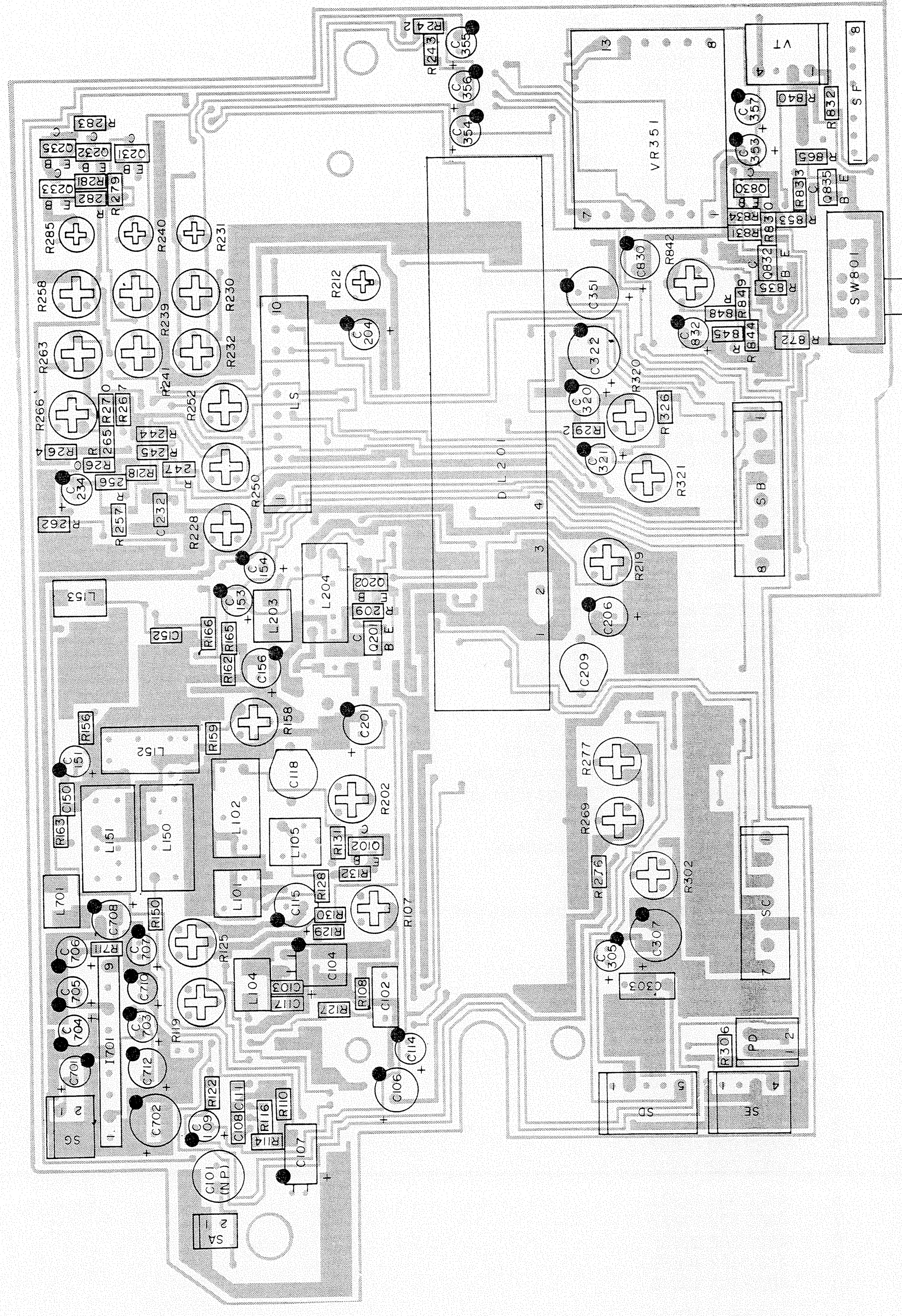


Fig. K

PROCESSING PANEL (solder side)

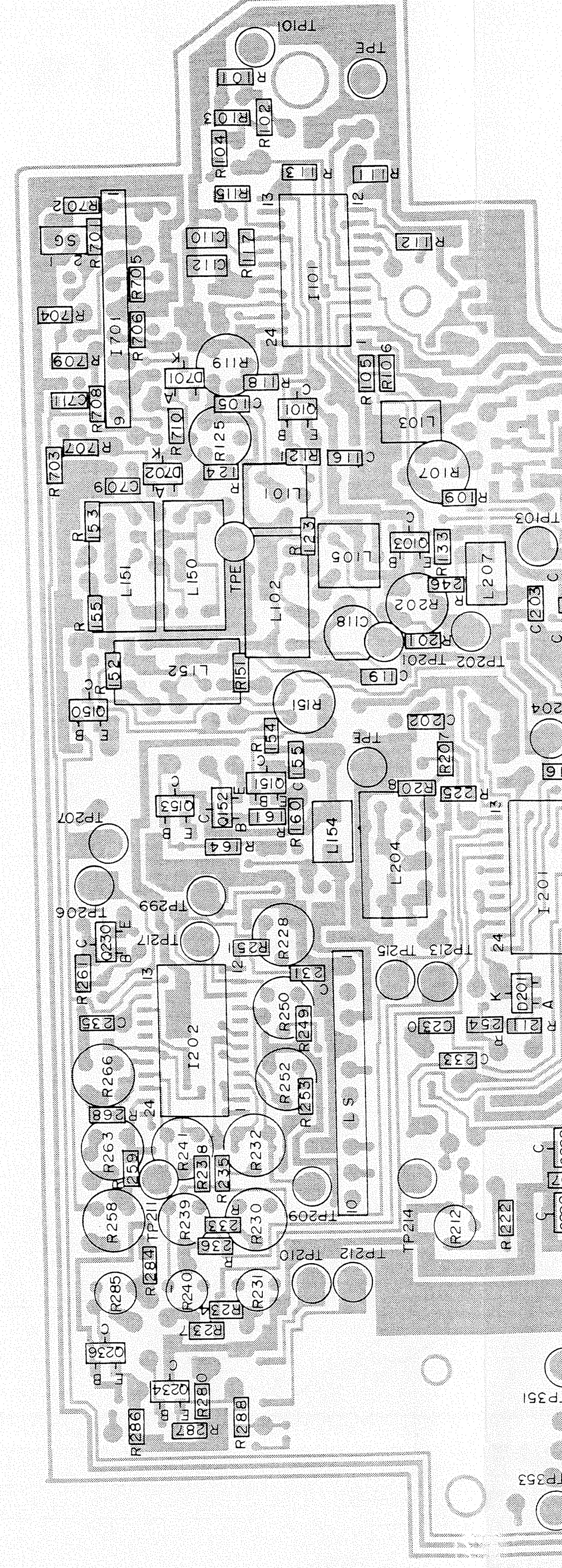
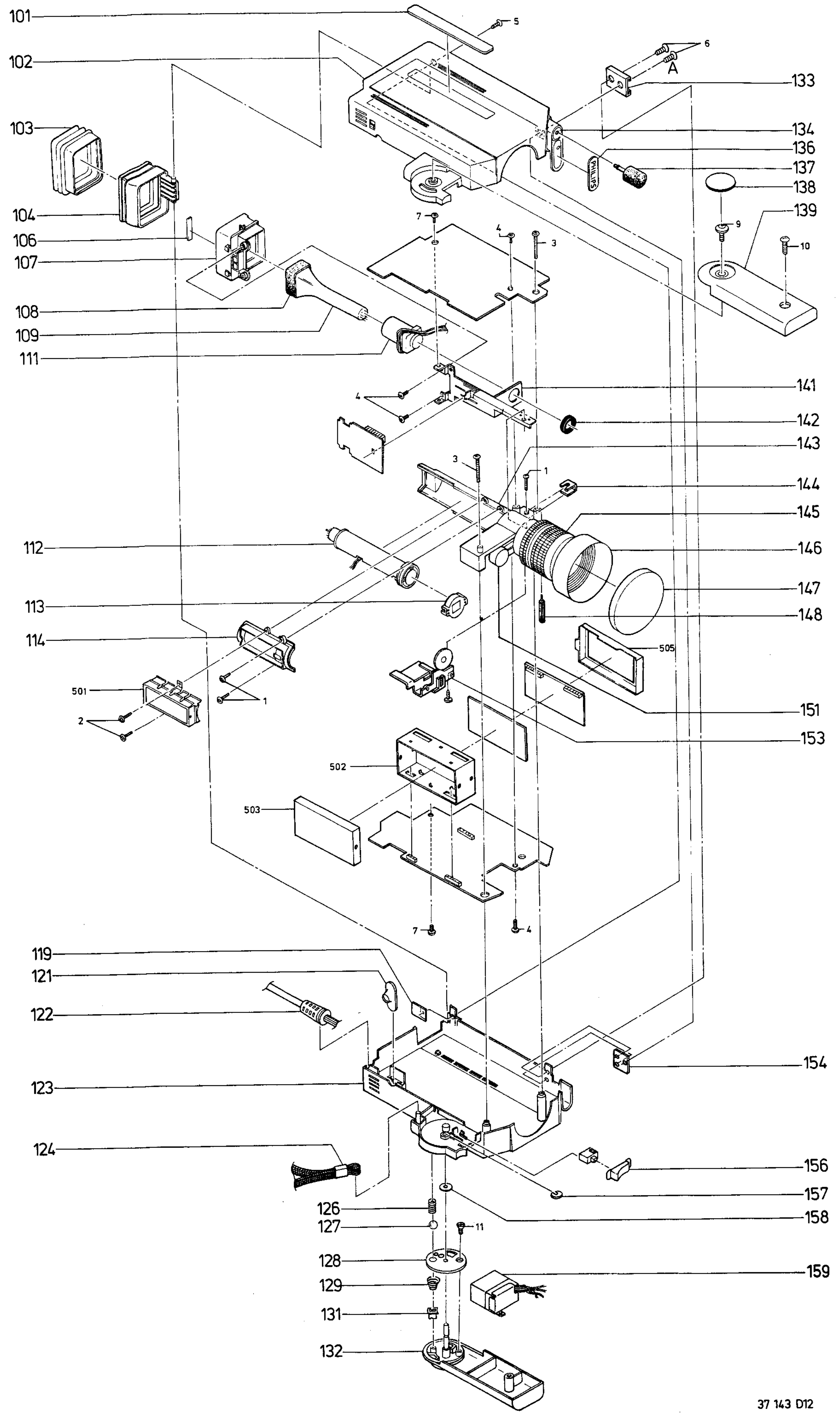


Fig. L

EXPLODED VIEW OF THE CAMERA


101
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11
159
37 143 D12

Mechanical parts list

101	4822 459 80245	Ornamental strip
102	4822 432 60049	Cover right
103	4822 462 40751	Eye piece
104	4822 693 40055	Lens viewfinder
106	4822 381 10742	Window
107	4822 450 70056	Mask
108	4822 466 61036	Ring
109	4822 131 90093	Picture tube 3JBX8
111	4822 150 10196	Deflection unit
112	4822 131 90092	Pick up tube assy S41 61P
113	4822 242 70935	Low pass filter unit
114	4822 256 80055	Holder
119	4822 492 41192	Spring
121	4822 505 10747	Tripod nut
122	4822 321 21073	Camera cable
123	4822 432 60048	Cover left
124	4822 498 20094	Carrying strap
126	4822 492 32208	Spring
127	4822 520 40158	Ball
128	4822 464 20018	Guide
129	4822 492 32228	Spring
131	4822 464 20014	Deblocking knob
132	4822 464 20016	Handgrip left
133	4822 404 60171	Accessory shoe
134	4822 267 30608	Jack
136	4822 459 10656	Name plate
137	4822 242 30126	Microphone
138	4822 462 40749	Cap
139	4822 464 20017	Right handle
141	4822 462 71352	Viewfinder bracket
142	4822 325 80259	Ring
143	4822 256 80054	Lens holder
144	4822 404 60173	Bracket
145	4822 381 20082	Zoomlens
146	4822 432 60051	Sunhood
147	4822 432 60052	Dust cap
148	4822 498 91001	Zoom lever
151	4822 693 40056	Diaphragm unit
153	4822 212 50199	Orange filter unit
154	4822 404 60172	Bracket
156	4822 464 20015	Push button
157	4822 532 11038	Ring
158	4822 532 51612	Ring
159	4822 276 11437	Switch mode unit

1	4822 502 11928
2	4822 502 11932
3	4822 502 11929
4	4822 693 40037
5	4822 502 11933
6	4822 502 11931
7	4822 502 11927
8	4822 502 30355
9	4822 693 40039
10	4822 693 40046
11	4822 693 40044

Electrical parts list

Minimatch male (23 pol)	4822 265 51045
Minimatch female (23 pol)	4822 267 60139
Male 2 pol SA	4822 267 20245
Male 2 pol SG-BL-PD	4822 265 30331
Male 3 pol PC	4822 265 40331
Male 4 pol VO	4822 265 30332
Male 4 pol DY-VT-SE-SR	4822 265 30332
Male 6 pol DF	4822 265 40364
Tube socket for 3JBX8	4822 255 70215
Tube socket for S4161P	4822 255 70214

MODULE

Preamplifier	4822 212 50193
Main SSG/Encoder	4822 212 50196
Sub SSG/Encoder	4822 212 50197

0.22 µF	50 V	4822 124 21618
1 µF	10 V tantal	4822 124 10467
1 µF	50 V	4822 124 21617
1 µF	63 V	4822 124 40969
1 µF	100 V	4822 124 21613
1 µF	400 V	4822 124 40627
3.3 µF	50 V	4822 124 21619
4.7 µF	50 V	4822 124 21632
10 µF	6.3 V	4822 124 40974
10 µF	16 V	4822 124 40956
10 µF	16 V	4822 124 40634
10 µF	16 V	4822 124 21628
10 µF	50 V	4822 124 40968
10 µF	50 V	4822 124 21625
10 µF	63 V	4822 124 21637
10 µF	63 V	4822 124 40968
22 µF	6.3 V	4822 124 40962
22 µF	6.3 V	4822 124 21623
22 µF	6.3 V	4822 124 40957
22 µF	10 V	4822 124 10469
33 µF	6.3 V	4822 124 21638
33 µF	10 V	4822 124 21633
47 µF	4 V tantal	4822 124 10468
47 µF	6.3 V	4822 124 21641
47 µF	6.3 V	4822 124 40955
47 µF	10 V	4822 124 21636
47 µF	10 V	4822 124 21639
47 µF	10 V tantal	4822 124 21601
100 µF	6.3 V	4822 124 21608
100 µF	6.3 V tantal	4822 124 40954
100 µF	10 V	4822 124 21606
100 µF	10 V	4822 124 40975
100 µF	16 V	4822 124 40967
220 µF	6.3 V tantal	4822 124 21635
220 µF	10 V	4822 124 21605
220 µF	16 V	4822 124 21612
220 µF	35 V	4822 124 21631
470 µF	6.3 V	4822 124 21609
470 µF	10 V	4822 124 21611
470 µF	10 V tantal	4822 124 10473

(Bipolar)

C934	1 µ	50 V	4822 124 40972
C556/925	4µ7	16 V	4822 124 40971
C460	10 µ	10 V	4822 124 40973
C504	22 µ	10 V	4822 124 32407
C101	47 µ	10 V	4822 124 21602

Chip capacitors (5%, 50 V)

2 pF	(± 0.25 pF)	4822 122 32366
8 pF	(± 0.5 pF)	4822 122 32371
22 pF		4822 122 32389
27 pF		4822 122 32392
33 pF		4822 122 32393
39 pF		4822 122 32412
47 pF		4822 122 32369
150 pF		4822 122 32365
180 pF		4822 122 32379
220 pF		4822 122 32391
270 pF		4822 122 32381
330 pF		4822 122 32368
470 pF		4822 122 32409
680 pF		4822 122 32401
820 pF		4822 122 32385
1 nF		4822 122 32397
2n2		4822 122 32399
2n2	(500 V)	4822 122 32383
10 n		4822 122 32398
10 n	(80%)	4822 122 32402
47 n	(25 V)	4822 122 32384
47 n	(80%)	4822 122 32373
47 n	(80%-25 V)	4822 122 32395
100 n	(80%-25 V)	4822 122 32372
100 n	(80%-50 V)	4822 122 32411

Mepolesco

C606	1 nF		4822 121 42334
C907	22 nF		4822 121 42332
C102	47 nF		4822 116 52837
C903	680 nF		4822 121 42331
C935	100 nF		4822 121 42333
C904	1n5		4822 121 42336
C603	0.56 n	100 V	4822 121 42337

(Chip)

8.2 µH	4822 157 52113
12 µH	4822 157 52109
47 µH	4822 157 52126
56 µH	4822 157 52112
100 µH	4822 157 52107
470 µH	4822 157 52111

L101	(3.9 MHz reject)	4822 157 52096
L105	(BPF 3.9 MHz)	4822 157 52101
L152	(VE-LPF)	4822 157 52104
L150	(YH-DL)	4822 157 52106
L151	(YH-LPF)	4822 157 52095
L102	(YL-LPF)	4822 157 52093
L204	(GKP-DL)	4822 157 52105
L442	(H-APT-DL)	4822 157 52103
L476	(CCD-LPF)	4822 157 52094
L503	(CCD-LPF)	4822 157 52094
L551	AFC	4822 157 52101
L601	22 mH	4822 157 52097
L602	22 mH	4822 156 10695
L914	(Linearity)	4822 157 52114
L903	470 µH	4822 157 52099
T901	Flyback trafo	4822 130 42458

DL201	Delay line 64 µsec.	4822 320 40113

X550	17.73 MHz	4822 242 70931

0.06 W - 5%

0E		4822 111 90651
0E (0.125 W)		4822 111 90735
20E (1%)	R422	4822 111 90673
56E		4822 111 90704
56E (0.125 W)		4822 111 90649
100E		4822 111 90652
120E		4822 111 90659
150E		4822 111 90666
220E		4822 111 90784
330E		4822 111 90691
390E		4822 111 90689
470E		4822 111 90697
510E		4822 111 90733
560E		4822 111 90701
680E (1%)	R112	4822 111 90708
680E		4822 111 90709
820E		4822 111 90715
1k		4822 111 90734
1k2		4822 111 90661
1k5		4822 111 90667
1k8		4822 111 90674
2k		4822 111 90732
2k2		4822 111 90679
2k7		4822 111 90685
3k3		4822 111 90692
3k9		4822 111 90694
4k7		4822 111 90698
5k1 (1%)	R903	4822 111 90718
5k6 (1%)	R619	4822 111 90702
5k6		4822 111 90703
6k8		4822 111 90711
8k2		4822 111 90716
10k (1%)	R671/672	4822 111 90654
10k		4822 111 90655
12k		4822 111 90664
15k		4822 111 90668
18k		4822 111 90675
20k		4822 111 90677
22k		4822 111 90681
27k		4822 111 90686
30k		4822 111 90688
33k		4822 111 90693
39k		4822 111 90695
43k		4822 111 90696
47k		4822 111 90699
56k		4822 111 90785
68k		4822 111 90712
82k		4822 111 90717
100k		4822 111 90656
120k		4822 111 90665
150k		4822 111 90669
220k		4822 111 90682
240k		4822 111 90684
270k		4822 111 90687
560k		4822 111 90705
620k		4822 111 90707
680k		4822 111 90713
1M		4822 111 90657
1M5		4822 111 90671
1M8		4822 111 90676
10M (0.125 W)		4822 111 90647

100E	4822 100 10531
150E	4822 100 10807
330E	4822 100 10532
470E	4822 100 10745
1k	4822 100 10534
1k5	4822 100 10808
2k2	4822 100 10535
3k3	4822 100 10746

4k7	4822 100 10708
10k	4822 100 10709
15k	4822 100 10711
22k	4822 100 10755
47k	4822 100 10632
330k	4822 100 10805
1M	4822 100 10806
3M3	4822 100 10809
5M6	4822 100 10804
VR401	4822 100 10811
VR351	4822 100 10812

Metal film 0.125 W

4E7	4822 111 90645
5E6	4822 116 52872
4k3	4822 116 52871
2M (0.5 W)	4822 116 52873
3k9 (0.25 W)	4822 116 52874
5k6 (0.25 W)	4822 116 52875
430k (0.25 W)	4822 116 52876

DX0103	4822 130 32639
DX0139	4822 130 31883
HZ6C	4822 130 32644
MA151K	4822 130 32635
MA152K	4822 130 32652
PX0040	4822 130 32647
PX0041	4822 130 32648
PX0042	4822 130 32649

2SA812M5	4822 130 42463
2SA812M6	4822 130 42464
2SA1122S	4822 130 42459
2SA1122C	4822 130 42461
2SB792R	4822 130 42499
2SB1000A	4822 130 42465
2SC1623L	4822 130 42478
2SC1623L5	4822 130 42466
2SC1623L6	4822 130 42479
2SC2404C	4822 130 42468
2SC2462C	4822 130 42481
2SC2618RC	4822 130 42501
2SC2690A	4822 130 42469
2SD1368CA	4822 130 42471
2SD814AR	4822 130 42473
2SD1419D	4822 130 42502

Tubes

S4161P (Pick up tube)	4822 131 90092
3JBX8 (Picture tube)	4822 131 90093

AN2110S	4822 209 82771
AN2210S	4822 209 82772
AN2310S	4822 209 82773
AN2320S	4822 209 82774
AN2410S	4822 209 82775
AN2510S	4822 209 82776
BA333	4822 209 81421
MN6160P	4822 209 82777
MN8037S	4822 209 82778
NJM3403M	4822 209 82779
NJM3415M	4822 209 82781
NJM4556M	4822 209 82782
TC4049BF	4822 209 82783

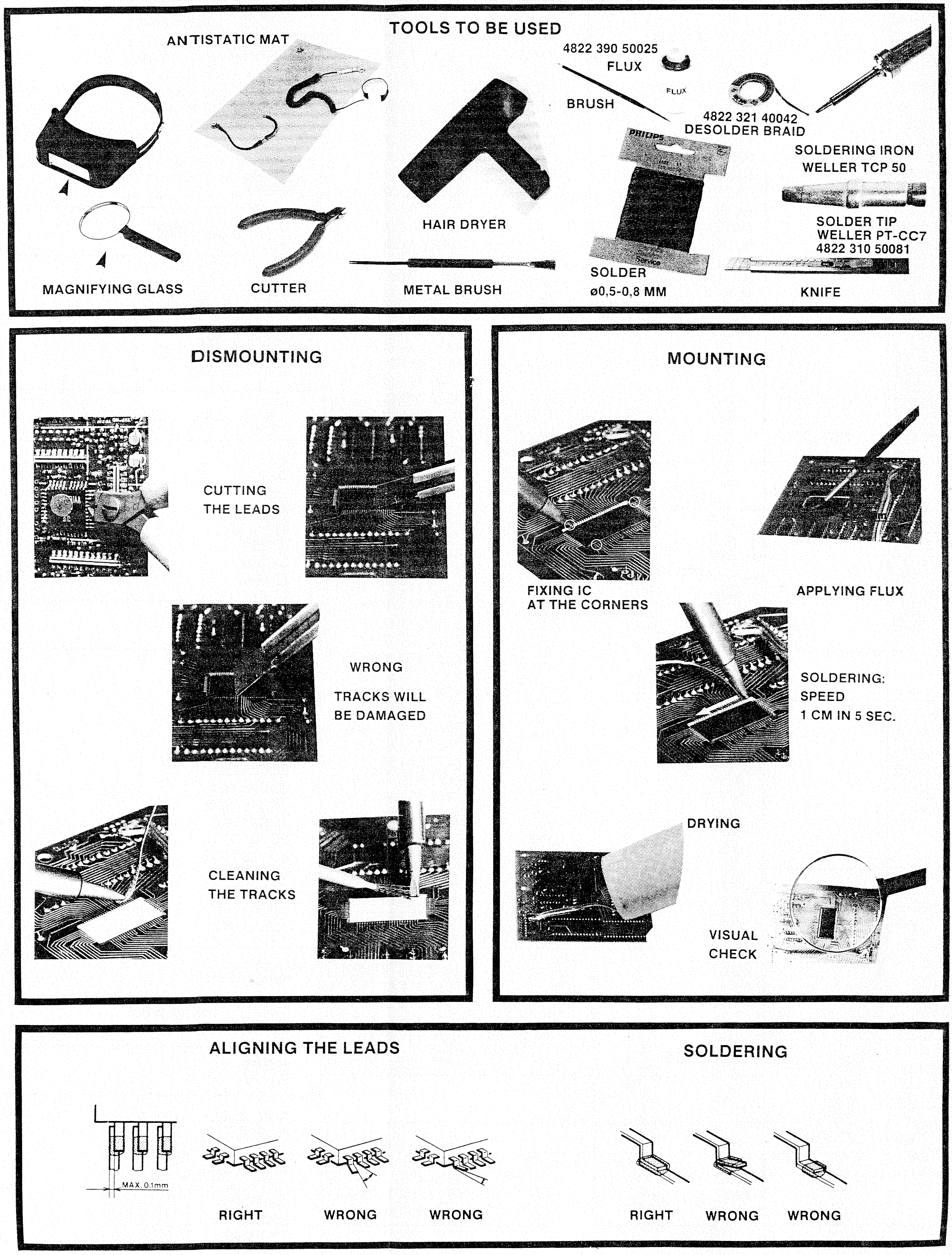
TOOLS TO BE USED
ANTISTATIC MAT
4822 390 50025
FLUX
FLUX
BRUSH
4822 321 40042
DESOLDER BRAID
PHILIPS
Service
SOLDERING IRON
WELLER TCP 50
SOLDER TIP
WELLER PT-CC7
4822 310 50081
HAIR DRYER
MAGNIFYING GLASS
CUTTER
METAL BRUSH
SOLDER
ø0,5-0,8 MM
KNIFE
DISMOUNTING
CUTTING
THE LEADS
WRONG
TRACKS WILL
BE DAMAGED
CLEANING
THE TRACKS
MOUNTING
FIXING IC
AT THE CORNERS
APPLYING FLUX
SOLDERING:
SPEED
1 CM IN 5 SEC.
DRYING
VISUAL
CHECK
ALIGNING THE LEADS
MAX. 0.1mm
RIGHT
WRONG
WRONG
SOLDERING
RIGHT
WRONG
WRONG

Fig. M